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ABSTRACT

The first component of this three-part package is a student manual designed to be used independently in secondary health occupations programs or on-the-job training programs for dental assistants. The manual contains seven units that cover the following topics: introduction to dentistry; basic office procedures; infection control and occupational safety; basic anatomy of the oral cavity; operative equipment; dental radiology; and basic laboratory procedures. Units are organized in lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets. Each unit has a written evaluation to test students' knowledge and skill sheets that provide a record for mastery of the steps of procedure for each skill. A unit checklist located at the end of each unit provides a method for keeping track of activity sheets, clinical and laboratory activity sheets, skill sheets, and written unit evaluations. The second package component, the instructor key, provides answers to the activity sheets and unit evaluations. The third package component is a one-page student competency record. Contains 28 references and a glossary of 73 terms. (KC)

50-1143-S

Dental Aide

Student Manual

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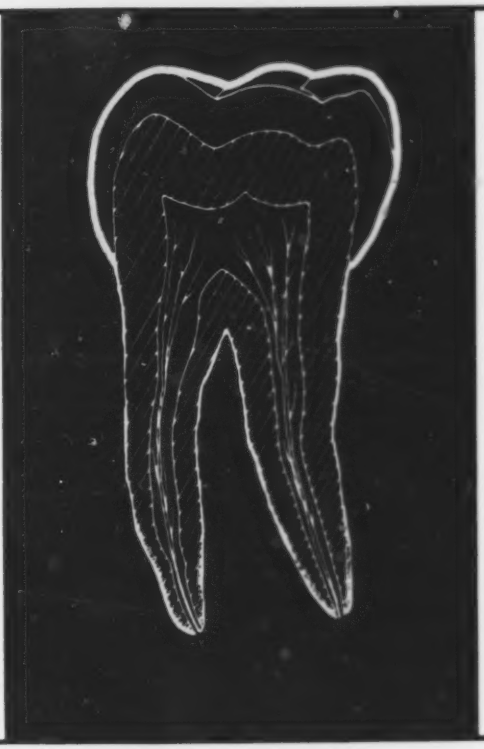

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Dental Aide

Student Manual

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Dental Aide Certificate of Achievement

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Foreword

This *Dental Aide* manual is designed to be used independently by students who are in secondary health occupations programs or by individuals receiving on-the-job training in the dental office. A clinical site (dental office) is needed for individuals to practice dental aide skills and to demonstrate mastery of those skills.

This manual is divided into seven units: Introduction to Dentistry, Basic Office Procedures, Infection Control and Occupational Safety, Basic Anatomy of the Oral Cavity, Operative Equipment, Dental Radiology, and Basic Laboratory Procedures. Units are further divided into lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets as appropriate for the content. Activity Sheets are designed to assist the learner in mastering the information in each lesson. The Clinical/Laboratory Activities included on the Activity Sheets should be reviewed or discussed with the instructor or clinical supervisor upon completion.

Each unit has a written evaluation, which should be taken after all lessons in the unit are studied. A score of 80 percent is needed for mastery of information in the unit. Skill Sheets provide a record for mastery of the steps of procedure for each skill. The learner should practice the skills outlined in the lessons before requesting evaluation of the skills. Not all lessons contain Skill Sheets. Your clinical supervisor will be evaluating mastery of the skills.

A Unit Checklist, located at the end of each unit, provides a method for keeping track of Activity Sheets, Skill Sheets, and Written Unit Evaluations to be completed in the unit.

The Written Unit Evaluations and Skill Sheets are included at the end of the manual. If you are taking this instruction under the supervision of an instructor or clinical supervisor, these pages may have removed from your manual. When you are ready to complete a Written Unit Evaluation or a Skill Sheet, check with your instructor or clinical supervisor.

Those using this manual on an individual basis may want to order the Instructor's Key, which provides answers to Activity Sheets and Unit Evaluations.

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Glossary

A

Acquired Immune Deficiency Syndrome (syn´ drōm) (AIDS) - disease characterized by an irreversible suppression of the immune system, which compromises the ability of the immune system to fight off opportunistic infections.

Acrylic - plastic

Acrylic bur - a special large bur designed to trim the plastic parts off appliances and dentures (normally attached to a motorized lathe)

Air compressor - air compressing machine used to run handpieces and 3-way syringes in the dental office

Alginate (ăl´-jĭ-nāt) - a powder that is derived from seaweed; used to make a dental impression when mixed with water

Amalgam (ah-mal´găm) - silver fillings which are used in the posterior teeth

Amalgam condenser (kŭn-´den(t)-sŭr) - a small metal instrument with a flat surface that can be round or oval/rectangular in design, used for packing and condensing amalgam

Amalgam restoration - uses amalgam to restore all surfaces of the posterior teeth

Anterior (an ´tir ē ŭr) - toward the front of the oral cavity or dental arches; describes the incisor and canine teeth

Apex (´a peks) - the end of the root of a tooth; the apex tip contains the apical foramen

Apical (ă p´ ĭ kal) foramen (fō-rā´ mĕn) - a passageway for nerves and blood vessels to enter and leave the tooth

Apicoectomy (ā˝pĭkō-ĕk´tō-mē) - surgical removal of the apex of a root

Arch (´ŏ rch) - a structure of the upper or lower jaws that holds the teeth and their supporting tissues in place, extending from the last tooth on the right side of the upper or lower jaw to the last tooth on the left side of the upper or lower jaw

Aspirating (ăs´pĭ-rāt ing) syringe - allows the dentist to determine if he/she is injecting the anesthetic solution in a blood vessel

Autoclaving (aw´tō-klāv ing) - sterilization accomplished by superheated steam under pressure, similar to a pressure cooker

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Pronunciation Guide: \ā\ as in hate; \ă\ as in fat; \ah\ as in pa; \ē\ as in me; \ĕ\ as in bet; \e\ as in her; \ī\ as in by; \ĭ \as in hit; \ō\ as in coat; \ŏ\ as in not; \o\ as in or; \oo\ as in noose; \ū\ as in due; \ŭ\ as in or; \uh\ as in cut; \ul\ as in full

B

Bench motor - trims orthodontic appliances and dentures and polishes the acrylic parts of these items; also known as a motorized lathe

Biopsy (bī´ŏp-sē) - surgical removal of tissue to test for cancer

Bitewing (bīt´wing) radiograph - shows both maxillary and mandibular teeth in the biting position on the same film; primarily used to detect interproximal decay

Blood or Other Potentially Infectious Materials (BOPIM) - blood, any body fluid that is visibly contaminated with blood, saliva in dental procedures, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; any unfixed tissue or organ (other than intact skin) from a human (living or dead)

Bloodborne pathogens - any disease-producing organism which may be transmitted through contact with blood and other body fluids or tissues

Bloodborne Pathogens Standard - the 1991 OSHA document that regulates the work practices of employees who are exposed to Blood or Other Potentially Infectious Materials in the course of performing their job duties

Buccal (bŭk´ ŭl) surface - surface of a posterior tooth that faces the inside of the cheeks

Burnishers (bŭr-nish) - smooth out rough edges of amalgam at the margins of restorations; designed in several forms, including round, football, beaver tail, and anatomical.

Burs (bŭrz) - rotary instruments used to cut tooth surfaces

C

Calcified (kăl´ sĭ fīd) - made of hardened, bonelike material resulting from calcification

Calculus (kăl´-kyŭ-lŭs) - a hard calcium deposit on the tooth; technical name for tartar

Carcinogenic (kar-sin-ŭ-jen-ik) - cancer-causing substance

Caries (kā´ rēēz) - tooth decay or cavity

Cast - model or cast made from an impression of a dental arch

Cementum (sē mĕn´ tŭm) - calcified tissue that covers the root of a tooth

Centers for Disease Control and Prevention (CDC) - a branch of the U.S. Department of Health and Human Services, Public Health Service that does research in matters that affect the health of all people and makes suggestions for the prevention of disease

Central incisors - teeth closest to the midline in each quadrant; one central incisor in each quadrant and two in each arch; used to cut food so it can be safely swallowed and to play a role in forming clear speech sounds

Cephalometric (sĕf″ah-lō-mĕ′trĭk) radiograph - radiograph that shows the entire skull area; taken with the film outside the mouth

Complete Radiographic Survey (CRS) - usually consists of 18 films which display all of a patient's teeth in an orderly fashion; fourteen periapical and four bitewing radiographs

Composite (kŏm-′paz-ŭt/kŭm) - white fillings that are most commonly used on the anterior teeth

Composite restorations - used for aesthetic purposes on anterior teeth and other visible areas in the oral cavity

Corrosive (kŭ-′rō-siv/-ziv) - having a caustic and locally destructive effect on contact with another substance

Cross contamination - passing germs from one person or object to another

Crown - (1) aspect of a tooth that is covered by enamel and visible within the oral cavity if the tooth is erupted (2) a dental prosthesis restoring the anatomy, function, and aesthetics of the crown of a natural tooth

Cusp (kusp) - rounded points on the occlusal surface of a tooth

Cuspids (kūs pūd) or canines (kā′ nīn) - one of the anterior teeth located distal to the lateral incisors used to tear food; one cuspid in each quadrant and two in each arch

D

Daylight loader - automatic film processing unit for developing radiographs without a darkroom

Deciduous (dē sĭd′ ū ŭs) teeth - are the first to erupt in humans and are shed, or exfoliated, so that permanent teeth may erupt; also known as primary teeth

Decontaminated - cleaned and disinfected so that any potentially harmful germs are killed, removed, or inactivated

Dental auxiliary - members of the dental health team

Dentin (dĕn′ tĭn) - portion of the tooth that lies beneath the cementum and enamel; occupies all areas inside the tooth except the pulp chamber and root canals that house the pulp

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Dentition (dĕn tĭsh´ ūn) - all of the human teeth as they occupy their normal places within the oral cavity

Diagnosis - identification of a disease from its signs and symptoms

Diagnostic tools - methods and procedures used to make a diagnosis

Disinfection (dĭs˝ĭn-fĕk´shŭn) - process by which microbes are destroyed; because it does not include the destruction of viruses or spores, instruments and equipment should be disinfected only if they cannot be sterilized

Distal (´dis tŭl) - situated away from the midline following the curve of the dental arch

Distal surface - interproximal surface of a tooth that faces away from the midline

Dosimeter (dō-´sim-ŭt-ūr) - monitoring badge for radiation exposure

E

Elastomeric (ē-lăs-tō-mer-ĭk) impression - rubber-based impression materials usually supplied in the form of two pastes that form a stiff and elastic rubber used to take impressions that will be poured in stone

Electromagnetic (i-lek-trō-´mag-net-ik) spectrum (spek-trŭm) - a group of invisible radiations whose properties are determined by their wavelengths

Elevator (´el-ū-vāt-ŭr) - provides leverage to elevate or luxate a tooth from its socket, making room for the forceps to facilitate removal of the tooth

Enamel (in ´am ŭl) - highly calcified outer covering on the crown of a tooth which overlies and protects the dentin

Endodontics (ĕn˝dō-don´tĭks) - specialized field of dentistry that deals with the diagnosis and treatment of diseases and injuries of the dental pulp and periapical tissue

Erythema (ĕr˝-ĭ-thē´mah) - reddening of the skin

Ethics (eth - iks) - system of moral principles, quality, or practice; dealing with moral conduct and judgment

Evacuator (i-vak-yū-´wā-tor) - suctions water and debris from the patient's oral cavity and retracts the cheek and tongue from the field of operation

Exfoliation (ĕks fo˝ le ā´ shŭn) - the natural loss or shedding of the deciduous teeth through resorption of the deciduous roots

Extraction (ik-´strak-shŭn) - tooth removal

Extraoral (ĕkstrah-or´al) radiographs - are taken outside the mouth when large areas of the jaw or skull need to be examined

F

Facial (fā shŭl) surface - the surface of a tooth that faces the inside of the cheeks or lips; may be further divided into labial and buccal surfaces

Fluoride (flū-or´ īd) - a mineral found in the earth's crust that may be added to toothpastes, mouthrinses, and the water supply to help prevent dental caries

Forceps (fōr-sŭps/-seps) - are used to actually remove the tooth from its socket

G

Gingiva (jĭn´ jĭ vah) - tissue covered by mucous membrane that immediately surrounds the teeth

Gingivitis (jĭn˝ jĭ vī´ tĭs) - inflammation of the gums caused by undisturbed plaque left at and under the gumlines for more than a day

Glutaraldehyde (gloot-ŭ-´ral-dŭ-hīd) - a high-level disinfectant capable of sterilization if items are left in a 30-day activated solution for 6-10 hours

Gypsum (jĭp´-sŭm) - a mineral found in the earth's crust; plaster and stone are derived from gypsum

H

Handpiece - instrument used to remove decay from teeth and prepare them for restoration

Herpes (hĕr´ pēz) simplex (sĭm plĕx) viruses - may cause infection of the mouth, skin, eyes, and genitals called herpes; lesions on lips sometimes called fever blisters

Human Immunodeficiency (ĭ-mū-nō-di-´fish-ŭn-sē) Virus (vī´rŭs) (HIV) - microorganism that causes the disease Acquired Immune Deficiency Syndrome (AIDS)

I

Impacted (im ´pak tŭd) - situation in which an unerupted tooth is located so that it cannot erupt normally

Impression - a "mold" of the patient's oral cavity in which the teeth and gums are imprinted

Incisal (ĭn sī zăl) edge - the cutting edge of an anterior tooth

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Incisors (īn sī´ zor) - cutting tooth; there are two incisors in each quadrant and four in each arch

Infectious (ĭn-fĕk´shŭs) disease - occurs when a microorganism in the body multiplies and causes damage to the tissue

Interproximal (int ŭr˜ prok sŭ mūl) surfaces - face toward or away from the midline and contact the interproximal surfaces of adjacent teeth

Intraoral (īn˜trah-or´al) radiographs - show the inside of the mouth

Inventory item - any supply item that requires replacement

Iodophors (ī-ō´dō-forz) - recommended surface disinfectant composed of iodine; available as hard surface disinfectants and surgical antiseptic scrubs

Ionization (ī˜on-ĭ-zā-shŭn) - produces biological changes in living tissue

J

Jaundice (jawn´ dĭs) - yellowing of the skin and whites of the eye

L

Labial (lā´ bē-ăl) surface - facial surface of an anterior tooth that faces the inside of the lips

Latent image - describes radiographic film after it has been exposed to x-rays; the latent image will be visible after the film is processed

Lateral (´lat ŭ rūl) incisors - located distal to the central incisors; there is one lateral incisor in each quadrant and two in each arch

Lingual (lĭng´ gwahl) surface - faces the tongue or the roof of the mouth

Local anesthesia (ăn˜ĕs-thē´zē-ah) - relieves the sensation of pain for the dental patient in the area where the procedure is to be performed

Luxate (lŭk-´sāt) - to loosen the tooth from its socket

M

Malocclusion (mal-ŭ-klū´zhŭn) - misalignment of the teeth and arches so they interfere with chewing and personal appearance

Mandible (măn dĭ bĭl) - single horse-shoe shaped bone that forms the lower jaw

Mandibular (măn dĭb´ ū lahr) arch - contains the lower teeth and their supporting structures; named for the mandible which forms the lower jaw

Mandibular teeth - are normally rooted within the mandible; complete adult dentition consists of 16 mandibular teeth within the mandibular arch

Mastication (mas tŭ´ kā shŭn) - act of chewing

Material Safety Data Sheets (MSDS) - provide highly specific information about hazardous chemicals, including the threat that they pose to employees' health and treatment for exposure to each hazardous chemical; MSDS also contain 24-hour-per-day phone numbers, and information on labeling chemicals, and personal protective equipment

Maxillary (măk˝ sĭl lĕr´ rē) arch - contains the upper teeth and their supporting structures; named for the front facial bones known as the maxillae

Maxillary teeth - are normally rooted within the maxillae; complete adult dentition consists of 16 maxillary teeth within the maxillary arch

Maxillofacial (măk-sĭl˝ō-fā´shŭl) - mouth cavity

Mesial (mē´ zē ăl) surface - interproximal surface of a tooth that faces the midline

Midline (´mid´ līn) - divides the dentition into right and left halves between the two front teeth on the maxillary and mandibular arches

Mixed dentition - the blend of permanent and primary teeth that exists within dental arches between the approximate ages of six and twelve years

Model - obtained by taking an impression of a dental arch

Model trimmer - an appliance used to trim away excess plaster from casts or models with a rotating rough-surfaced metal blade

Molars (mō lŭr) - twelve teeth located distal to the premolars in the posterior aspect of the dental arches; one first molar, one second molar, and one third molar in each quadrant, and two first, second, and third molars in each arch

Motorized lathe - trims orthodontic appliances and dentures and polishes the acrylic parts of these items; also known as a bench motor

N

Nitrous (´nī-trŭs) oxide (ŏk-sīd) unit - a combination of nitrous oxide with oxygen is used to calm dental patients and lessen their pain perception; the nitrous oxide tank is always blue, and the oxygen tank is always green

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Pronunciation Guide: \ā\ as in hate; \ă\ as in fat; \ah\ as in pa; \ē\ as in me; \ĕ\ as in bet; \e\ as in her; \ī\ as in by; \ĭ \as in hit; \ō\ as in coat; \ŏ\ as in not; \o\ as in or; \oo\ as in noose; \ū\ as in due; \ŭ\ as in or; \uh\ as in cut; \ul\ as in full

Nothing Before Something rule - while alphabetizing patient files, if the only difference in two names is the lack of a middle name or initial, then the name lacking that part is filed first

O

Occlusal (ŭ ´kloo sŭl) plane - the transverse plane that divides the oral cavity into upper and lower arches; its name is derived from the biting surfaces of back teeth, the occlusal surfaces

Occlusal radiographs - are large intraoral radiographs placed on the occlusal surfaces of upper or lower teeth to show large areas of the mouth

Occlusal surfaces - the biting or chewing surfaces of posterior teeth

Occupational Safety and Health Administration (OSHA) - a government agency responsible for monitoring the health and safety of employees in America's workplaces

Operative dentistry - field of dentistry that deals with the prevention and restoration of defects or decay of individual teeth

Operatory (op´er-ah-tor´ē) - the production areas of the dental office, also referred to as the treatment room; the operatory consists of a dental chair, assistant stool, operator's stool, dental unit, x-ray unit, operating light, and cabinets or units for the dental equipment

Opportunistic infection - one which would normally be controlled by the immune system (such as a cold or pneumonia) but cannot be controlled because the immune system is not working properly

Oral evacuator - suction device used to clear the patient's mouth of obstructions such as saliva, blood, and debris created during oral surgery

Oral (ōr-ŭl) surgery - is the area of dentistry involving surgical procedures on the oral tissues and the jaws, specifically dealing with removal of teeth, bony and soft tissue surgery, and treatment of fractured jaws

Orthodontics (or´thō-don´tĭks) - the specialized field of dentistry dealing with the causes, prevention, and treatment of the irregularities or malocclusion of the teeth and arches

OSHA Hazard Communication Standard - a set of regulations designed to protect all employees in America from potential injury or illness caused by contact with chemicals in the workplace

Out guide - a method used to mark the place where a file belongs if it is only going to be removed from the filing stacks for a short period of time; the out guide is like a book mark for the filing stacks

P

Pain perception - the level of discomfort a patient believes that he/she is experiencing

Palatal (pal´ at) surface - the surface of a maxillary tooth that faces the roof of the mouth; the palatal surface may also be referred to as the lingual surface, but the lingual surface must never be called the palatal surface

Panoramic (pan-ŭ-ram-ik) radiographs - extraoral radiographs that show both the mandible and maxilla in their entirety

Pathogens (păth-ŏ-jĕnz) - microorganisms that cause infectious diseases

Pediatric (pēd-ē-a´trik) dentistry - is children's dentistry

Pediatric mount - is used to display radiographs of children; it holds a smaller film than the standard mounts

Periapical (per˝ē-ā´pĭ-kal) radiograph - an intraoral radiograph that shows the entire tooth and surrounding tissues; are used to interpret normal, healthy conditions or areas of infection around the root area or in the surrounding bony structures

Periapical tissue - the tissue or area surrounding the root or apex of a tooth

Periodontal (per˝ē-ō-don´tal) disease - acute or chronic inflammation of the supporting structures of the teeth, including the bone surrounding the teeth and the gingival tissue

Periodontal probe - a measuring device used to detect disease

Periodontics (per˝ē-ō-don´tĭks) - is the specialized field of dentistry dealing with the treatment and prevention of periodontal disease

Periosteal (per˝ē-os´tē-al) elevator - is a long, pointed instrument designed with one spoon-shaped end and the other end shaped to fit under and detach the gingival tissue from around the neck of the tooth

Permanent teeth - are meant to remain within the dental arches for a lifetime without shedding or exfoliation

Personal Protective Equipment (PPE) - any item or garment designed to serve as a barrier to contamination of employees' eyes, skin, mucous membrane, or clothing from BOPIM

PID - part of the x-ray machine that aligns the useful beam to the object and film; commonly referred to as the cone

Plaque (plăk) - a colorless doughy collection of bacteria found in the mouth

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Plaster vibrator - used to remove trapped air from a bowl of plaster or stone during mixing; while pouring impressions, it helps the plaster and stone flow through the impression without trapping air

Posterior (pō ´stir ē ŭr) - toward the back of the oral cavity or dental arches; the premolar and molar teeth are known as posterior teeth

Precleaning - effectively removes debris from instruments through the use of sound waves

Premolar (´prē mō lŭr) - one of the eight teeth located between the canines and the first molars; there are one first and one second premolar in each quadrant and two first and two second premolars in each arch; premolars assist the canines in tearing food into pieces and the molars in grinding and pulverzing food

Presoaking - prevents airborne transmission of microorganisms; if instruments cannot be cleaned soon after use, place them in a holding presoak solution to prevent blood and saliva from drying on them

Primary teeth - the initial set of teeth in human beings; they begin to erupt between the ages of six to eight months and begin to shed between the ages of six to seven years

Prophylaxis (prō˝fi-lak´sis) - a cleaning procedure used to remove substances (plaque, tartar, and stains) from the surfaces of teeth in order to prevent diseases of the oral cavity

Prosthesis (pros˝thē-sĭs) - a replacement of a natural part of the body with an artificial substitute; dental prostheses include bridges, dentures or partial dentures

Prosthodontics (pros˝tho-don´tĭks) - the specialized field of dentistry dealing with the artificial replacement of missing natural teeth

Pulp - soft inner tissue of the tooth

Pulp chamber - open space within the crown of a tooth that is occupied by the pulp

Pulp tissue - is found in the root canal and pulp chamber of the tooth; contains blood and nerve tissue that supply the teeth with sensation and nutrition

Pulpotomies (pul-pot´ō-mēz) - partial removal of pulp tissue

Pumice (pŭm´ĭs) - an abrasive substance that can put a smooth finish on the plastics used in dental appliances

Q

Quadrant (´kwŏd rŭnt) - ¼ of the total dentition as divided by the intersection of the occlusal and transverse planes; each quadrant contains the same numbers and types of teeth

R

Radioactive (rā˝-dē-ō-āk-tiv) - emitting high energy particles that can damage living cells

Radiographs - dental x-rays

Rag wheel - a soft wheel made of cotton used with pumice to polish the plastic parts of appliances and dentures; normally attached to a motorized lathe

Regulator valve - controls how much gas is released from a tank at one time

Resorption (rē sorp´ shŭn) - process by which tissues dissolve and are then absorbed by the body

Restoration - fillings

Restorative (ri-´stōr-ūt-iv) dentistry - includes the process of restoring defects or caries in individual teeth

"Right to Know" law - dictates that employees have a right to know about health hazards in the workplace and how to protect themselves from such hazards

Root - part of the tooth embedded within the supporting structures; human teeth have one, two, or three roots

Root canal therapy - removing the damaged nerve and support tissue of a tooth and replacing the area with a cement or filler material

S

Sodium (sō´dē-ŭm) hypoclorite (hī˝pō-klō-rīt) - a recommended surface disinfectant commonly known as household bleach

Space maintainer - a small appliance that is attached to teeth adjacent to the space where a tooth has been lost, preventing adjacent teeth from drifting into the empty area

Spontaneous (spon-´tā-nē-ŭs) combustion - catching fire without warning

Sterilization (ster-ŭ-lū-´zā-shŭn) - process by which all forms of life are completely destroyed

Study models - casts of a patient's upper and lower arch which show the way the patient bites together; used to plan the treatment for a patient

Suction machine - provides suction for the oral evacuation systems in the dental office

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Supernumerary (soopŭr-´n(y)oo-mŭ-rer-ē) - extra teeth

Surgical aspirator (ăs´pĭ-rā-tor) tip - a specially designed oral evacuator with a small tip opening used to get down into the tooth socket to remove debris and to clear the surgical site from bleeding

Sutures (´soo-chŭrz) - stitches that may be used to control bleeding, promote good healing, and restore normal tissue anatomy

Syphilis (sĭfĭ- lĭs) - a venereal disease that may be contracted through the oral cavity in the form of a primary chancre and can be fatal; associated with the treponema pallidum microorganism

T

3-way syringe (sĭ-rĭnj´/sĭr´ĭnj) - is used to deliver a stream of water, a stream of air, and a combined spray of air and water

Thyroid (thī´roid) Collar - lead-lined neck collar that protects the patient during x-rays

Topical (tŏp-i-kŭl) anesthesia - is applied to the surface of the mucous membrane to reduce the discomfort of an injection at the puncture site

Toxic (´tok-sik) - poisonous

Treponema (trĕp˝ ō-nē´ mah) pallidum - is the microorganism associated with syphilis

Tubehead (Toob-hed) - part of the x-ray machine where radiation is actually produced, normally at the end of a flexible mechanical arm

Tuberculocidal (tŭ-bĕr´kūlō´sīdŭl) - kills tuberculosis germs

Tuberculosis (tū-bĕr´ kū-lō´ sĭs) (TB) - disease associated with the mycobacterium tuberculosis microorganism; this microorganism is usually found in the lungs, producing swelling which results in breathing difficulty

Twenty-minute acid attack - whenever people eat sugar and starches, the bacteria in plaque are eating, too; after the bacteria in plaque eat, they excrete acid onto the teeth for about twenty minutes

U

Unethical - not conforming to professional standards of conduct

Universal notation system - the ADA accepted method of identifying the individual teeth by number for permanent teeth and by letter for primary teeth

Universal precautions - techniques to protect the health care professional from getting an infection from a patient; ALL blood and certain body fluids are treated with the same

precautions, as if they are all carriers of Hepatitis B Virus, Human Immunodeficiency Virus, or other bloodborne pathogens

V

Viewbox - a lighted box used to view radiographs during mounting or diagnosis

Viral (vī rŭl) hepatitis (hĕp˜ ah-tī´tĭs) - disease associated with the Hepatitis B virus, an inflammation of the liver

Virucidal (vī´rū-´sīdŭl) - kills virus

X

X-rays (´eks-raz) - wavelengths of the electromagnetic spectrum that can penetrate tissue and produce a latent image; x-rays are imperceptible by any human senses

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Unit I

Introduction to Dentistry

After completing this unit, you should be able to identify the various members of the dental health team, along with various career opportunities available in dentistry. Patient confidentiality, and oral and personal hygiene are also an integral part of a health professional.

Unit Lessons

The Dental Profession

Personal Grooming

Ethical Standards

Lesson 1:
The Dental Profession

Objectives:

A. Identify the functions of the six members of the dental health team.

B. Match the six dental specialties with their roles.

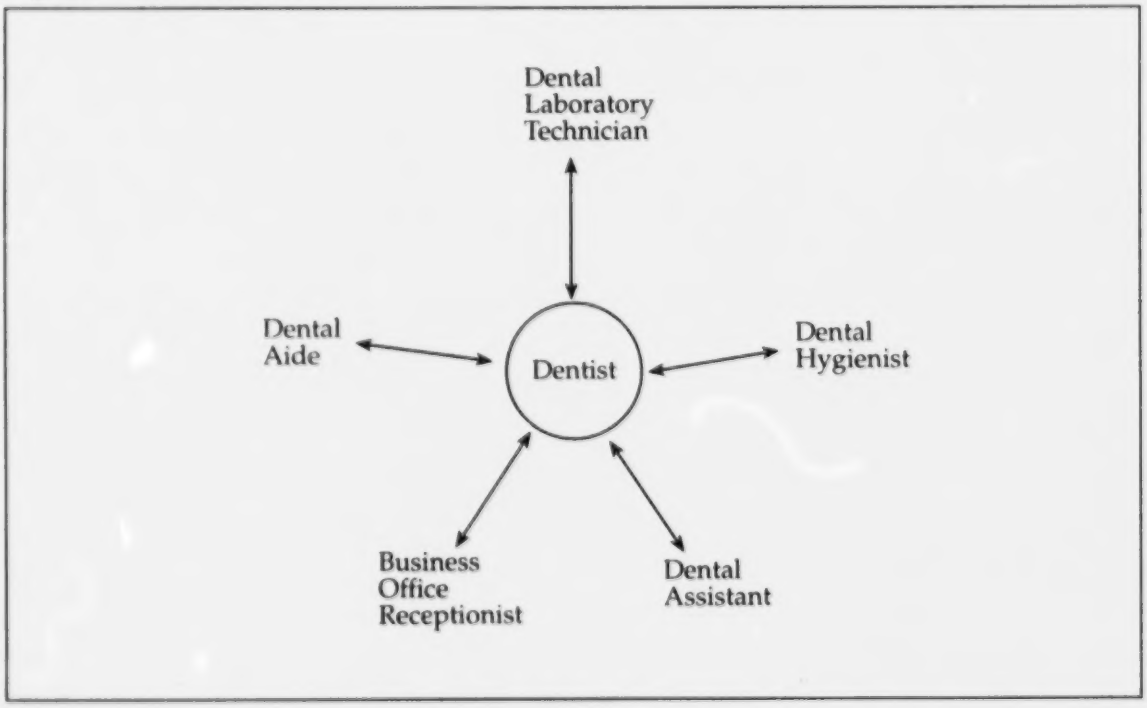
C. List the various job opportunities available in dentistry today.

Key Terms:

- Radiographs
- Prophylaxis (prō˝fi-lak´sis)
- Prosthesis (pros´thē-tĭst)
- Operatory (op´er-ah-tor˝ē)
- Operative Dentistry
- Endodontics (ĕn˝dō-don´tĭks)
- Dental Pulp
- Periapical Tissue (per˝ē-ā´pĭ-kal)
- Pulpotomies (pul-pot´ō-mēz)
- Root Canal Therapy
- Apicoectomy (ā˝pĭkō-ĕk´tō-mē)
- Maxillofacial (măk-sĭl´ō-fā´shŭl)
- Biopsy (bĭ´ŏp-sē)
- Orthodontics (or˝thō-don´tĭks)
- Malocclusion (mal-ŭ-klū´zhŭn)
- Pediatric Dentistry (pēd-ē-a´trik)
- Periodontics (per˝ē-ō-don´tĭks)
- Periodontal (per˝ē-ō-don´tal) Disease
- Calculus (kăl´-kyŭ-lŭs)
- Prosthodontics (pros´tho-don´tĭks)

The practice of dentistry is constantly undergoing change. Team dentistry is now the accepted concept of providing oral health care. Each team member contributes the necessary specialized skills that allow complete and professional care for patients. Team members include the dentist, dental assistant, dental hygienist, laboratory technician, the business office

Fig. 1.1 - The Dental Team



receptionist, and the dental aide. Although most dentists are engaged in the practice of general dentistry, various areas of specialties are available in dentistry today.

Members of the Dental Health Team

A "team" means a number of persons working together to achieve a common goal. In dentistry, the common goal is providing the best possible care for patients.

Dentists usually staff their offices with various specialized individuals who add to the total team concept of dentistry.

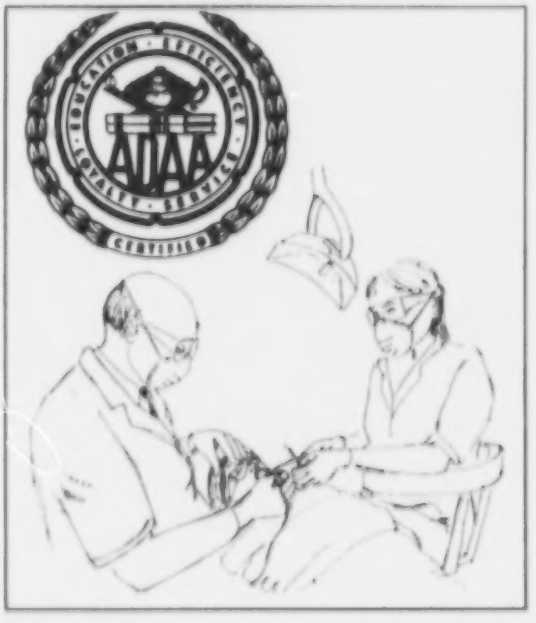
The dentist alone is responsible for the diagnosis and care plan for each patient. This may include operative dentistry, prosthesis, endodontics, periodontics, surgery, and orthodontics (terms are explained later in this lesson). A dentist has six to eight years of college education including dental school and must be licensed in the state in which he/she practices.

Fig. 1.2 - The Dentistry Seal

The dental assistant is the "chairside" helper who sits beside the patient and is the dentist's second pair of hands. This teamwork is commonly called "four-handed dentistry." The dental assistant will anticipate the dentist's needs and be ready to supply the materials and instruments needed for various procedures. Additional responsibilities include patient education; taking impressions of teeth; sterilizing instruments; exposing, processing, and mounting **radiographs** (dental x-rays); and preparing patients for treatment.

In 1960, the American Dental Assistants Association established educational requirements whereby a dental assistant can become a Certified Dental Assistant. A Certified Dental Assistant must have completed an accredited educational program or have three years on-the-job training prior to taking the certification exam. The title CDA is used to designate a Certified Dental Assistant after successfully passing the Dental Assisting National Board Exam.

Fig. 1.3 - The Dental Assistant



The dental hygienist is a licensed employee of the dentist who is permitted by state law to perform certain specific tasks under the direction of the dentist. **Prophylaxis** (scaling and cleaning of teeth), exposing radiographs, and patient education are some of the many tasks that a hygienist may perform under the supervision of the dentist. A minimum two-year course of study is necessary prior to certification or licensing. A hygienist uses the title Registered Dental Hygienist (RDH) and is governed by the Dental Practice Act of the state in which he/she practices.

Fig. 1.4 - The Dental Hygienist

The business office receptionist is the team member who plans the appointments, schedules the patients, and is responsible for the accounting and financial activities of the dental practice. The receptionist is also responsible for answering the telephone, which is one of the most important instruments in the office since it is often the first contact a patient has with the office.

Fig. 1.5 - Business Office Receptionist

A dental laboratory technician is the individual who constructs the **prosthesis** (crown, partical denture, or full denture) specified by a written prescription of a dentist. The fabrication of a prosthesis includes: preparation of the die (stone model), making a wax pattern of the teeth, and the actual casting or flashing of the prosthesis being prepared for the patient. Dental laboratory technicians receive their training through apprenticeships, commercial schools, or accredited programs. The Certified Dental Technician (CDT) is a credential established by the National Association of Dental Laboratories.

The dental aide can be the second set of hands for the dental assistant allowing the concept of "six-handed dentistry" (dentist, assistant, dental aide). The dental aide

should be familiar with the following aspects of patient care: infection control, basic anatomy of the oral cavity, basic business office procedures, operative, laboratory, and various radiologic (x-ray) procedures.

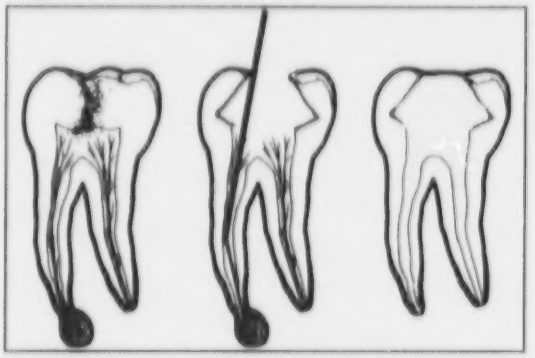
The dental aide can be a great asset in the dental office. The Dental Aide may be responsible for performing the following tasks: seating and dismissal of patients, preparing the **operatory** (treatment room) for procedures, preparation and sterilization of equipment and instruments, processing radiographs (developing x-rays), and mounting radiographs.

Dental Specialties

Most dentists are engaged in the general practice of dentistry; that is, the dental procedures they perform for their patients may include all specialty areas and **operative dentistry** (the field of dentistry that deals with the prevention and restoration of defects or decay of individual teeth). A specialist is a dentist who limits his/her practice to one type or field of dentistry. There are eight specialties recognized by the American Dental Association. The specialities of Oral Pathology and Dental Public Health are not included in this discussion since they do not commonly require the use of an assistant or dental aide.

Endodontics (end-"within" and dont-"tooth") is the speciality of dentistry that deals with the diagnosis and treatment of diseases and injuries of the **dental pulp** (soft inner tissue of the tooth) and **periapical tissue** (around the tip of the tooth's root). Treatment of pulpal and periapical conditions may include: **pulpotomies** (partial removal of pulp tissue), **root canal therapy** (removing damaged nerve and support tissue in the tooth root), and **apicoectomies** (removal of the tip of the root).

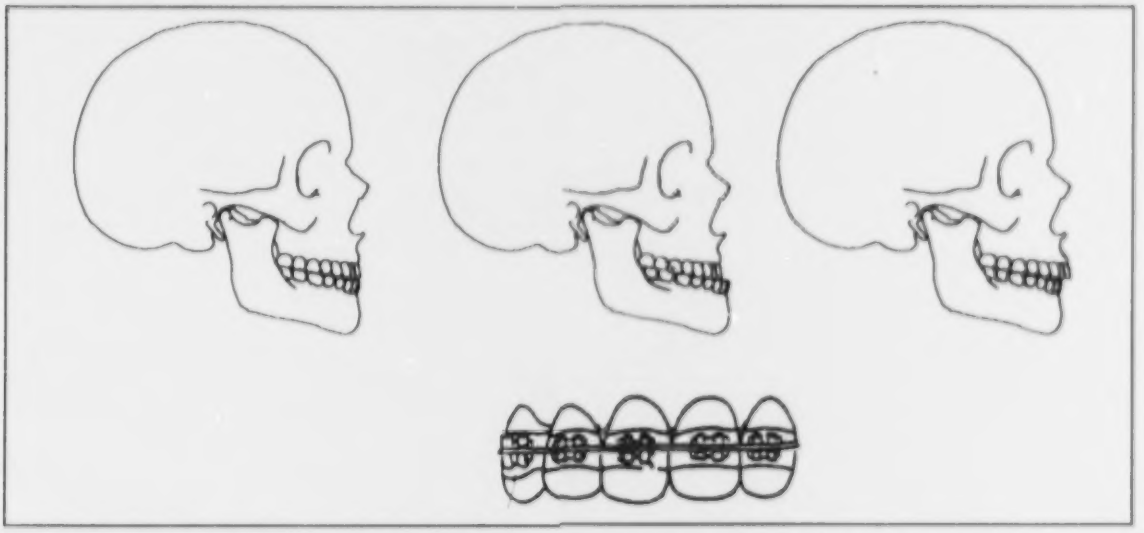
Fig. 1.6 - Root Canal Treatment



Oral and Maxillofacial Surgery is the part of dentistry that deals with the diagnosis and surgical treatment of diseases, injuries, and defects in the oral **maxillofacial** region (mouth cavity). The most common procedure in oral surgery is the removal of impacted teeth. Other procedures include removal of cysts, **biopsy** of lesions (surgical removal of tissue to test for cancer), and treatment of facial injuries and fractures.

Fig. 1.7 - Oral and Maxillofacial Surgery

Fig. 1.8 - Orthodontics



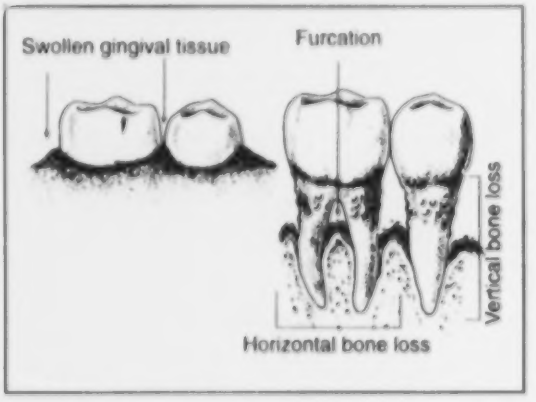
Orthodontics (ortho-"straight" and dont-"tooth") is the speciality of dentistry that deals with the causes, prevention and treatment of the irregularities or **malocclusion** (misalignment) of the teeth and arches. This is accomplished by an assorted group of wires, bands, or brackets. The most obvious purpose of orthodontics is to realign teeth into a more pleasing appearance and to establish normal chewing function.

Fig. 1.9 - Pediatric Dentistry

Pediatric Dentistry (children's dentistry) is a speciality similar in many respects to general practice of dentistry for adults except the patients are children. Child psychology plays an important role in a pediatric practice.

Periodontics (perio-"around" and dont-"tooth) is the speciality of dentistry that deals with the treatment and prevention of **peridontal disease** (diseases of the soft tissue and bone surrounding the teeth). The periodontist is interested in the

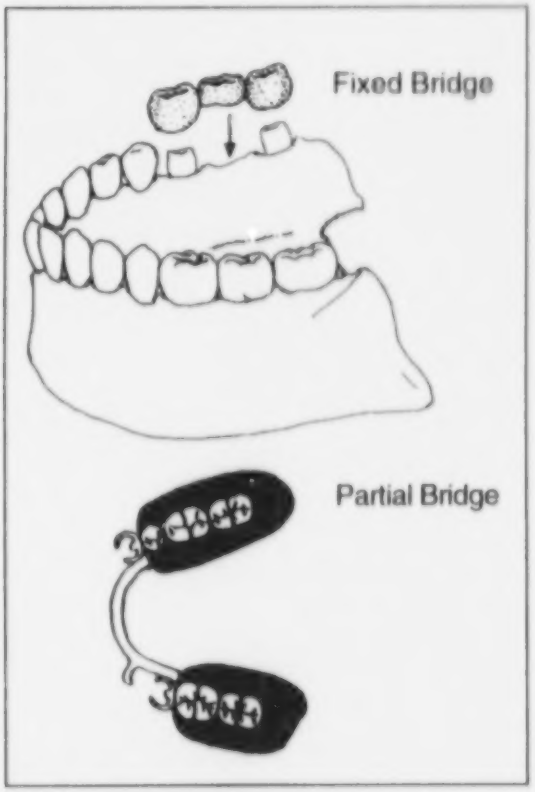
Fig. 1.10 - Peridontal Disease



following symptoms: bleeding of gums during tooth brushing, unpleasant breath, red and swollen gum tissue, and teeth that feel loose or mobile. Periodontal disease is treated basically by removing **calculus** (tartar, hard calcium deposits on teeth) and recontouring diseased gum tissue.

Prosthodontics (prosth-"putting on" and dont-"tooth") is the speciality that deals with the artificial replacement of missing natural teeth. Thus, if a person has lost permanent teeth, the dentist may construct a fixed bridge or a removable partial denture (Fig. 1.11). If a patient has no teeth left in an arch, a full denture may be necessary.

Fig. 1.11 - Fixed Bridge and Partial Denture



Job Opportunities

Clinical procedures will vary from one specialty area to another. The dentist and his/her staff must be highly trained to meet these professional needs. You may elect to work for a general practitioner or a specialist. A dentist may have a private (solo) practice or belong to a group of dentists, which is referred to as group practice.

Other areas of employment include:

Federal agencies offer jobs in clinics and hospitals that are federally funded.

Armed services are the branches of military service and provide dental clinics to ensure a healthy fighting force.

Hospitals may maintain a dental clinic for their patients.

University dental schools employ dental assistants to assist in training dental students in four-handed dentistry.

Dental educators are employed by institutions to train dental assistants.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: The Dental Profession

Activity Sheet

1. List the six members of the dental health team and describe their main role as part of the dental health team.

a. _____

_____

b. _____

_____

c. _____

_____

d. _____

_____

e. _____

_____

f. _____

_____

2. List five areas of job opportunities available in dentistry today.

a. _____

b. _____

c. _____

d. _____

e. _____

Clinical/Laboratory Activities

1. Visit your clinical site or local dental office and ask various individuals what they like most and least about their jobs. Ask them where they received their training.

Lesson 2: Personal Grooming

Objectives:

1. Identify the four essential personal grooming requirements in a dental office.

2. Identify two essential personal oral hygiene procedures of team members.

Personal Grooming

To create a good impression on patients, personal grooming is essential in the dental office. In dentistry, cleanliness is very important because you are in very close contact with people all day. It is advisable for everyone to have a soapy shower or tub bath each morning prior to leaving for work. It is also important to shampoo your hair at least every two or three days. Some people find it necessary to shampoo every day if they have excessively oily hair. A simple hair style is desirable in a dental office so it won't interfere with procedures. Make-up should be worn in moderation.

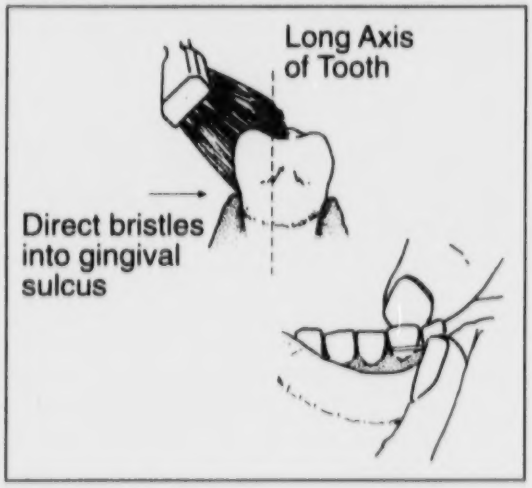
Uniforms, hose, and shoes should be of light color and compatible with the office policy.

Regardless of the color or style of your uniform, cleanliness and neatness are of utmost importance.

Oral Hygiene

Good oral hygiene, brushing and flossing, is essential for the dental health team member. We need to be role models for our patients. Our teeth should be brushed three times a day (morning, after lunch, and before retiring at night). Flossing is also an essential part of good oral hygiene. It is recommended that we floss at least once a day. Complete brushing and flossing techniques will be discussed in a later unit.

Fig. 1.12 - Essentials of Good Oral Hygiene



In addition to grooming, our ability to express ourselves both bodily and vocally, determines the impression we make on others. Good posture, maintained with an appearance of ease, is the foundation for a good public impression and suggests self-confidence.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 2: Personal Grooming

Activity Sheet

1. List three essential personal hygiene grooming standards.

   a. _____

   b. _____

   c. _____

2. List two essential oral hygiene requirements.

   a. _____

   b. _____

Clinical/Laboratory Activities

1. At your clinical site, discuss personal grooming standards with a dental assistant or with another dental aide. If you are performing on-the-job training at a large facility, review the Standard Operating Procedures manual for dress codes and personal hygiene standards to be applied when working for that firm.

Lesson 3: Ethical Standards

Objectives:

Describe ethics and how it affects the standards of behavior for dental team members.

Key Terms:

- Ethics

In providing a service to the public, as in the dental office, it is inevitable that you will come into contact with information that is to be treated with the strictest confidence. The close association the dental team enjoys with patients is one of the assets of the profession. The strict code of ethics is not only essential, it is mandatory. The patient's trust and confidence in the dentist and the dental team must never be violated. "What you see here, what you hear here, what you do here, stops here when you leave here."

Ethical dilemmas arise for all members of the dental health team in the performance of their profession. The dentist's professional conduct and your own are governed by the voluntary ethical standards established by your personal and professional code of ethics. **Ethics** deals with moral conduct and judgement. We all have personal ethical standards that reflect the way we act, the decisions we make, and the values we hold.

Ethics goes further than just trust and confidence, it deals with good and evil along with moral conduct and judgement. Ethics are voluntary controls - not laws. They should serve as a method of "self-policing" within the profession.

Principles of Ethics and Code of Ethics are the same. The American Dental Assistants Association adopted a Code of Ethics in 1980. Following is a summary of their goals:

- An individual assumes the obligation of maintaining and enriching the profession.
- One should strive at all times to maintain confidentiality and exhibit respect for the dentist/employer.
- One shall not perform any professional service which is prohibited by law and is obligated to prove competence prior to providing any services to a patient.
- An individual shall constantly strive tc upgrade and expand his/her technical skills for the benefit of the employer and the patient.
- One should participate in his/her state and local professional organization to sustain and improve his/her profession.

Unethical Actions:

- Discussion of patient treatment outside the office.
- Promising "miraculous results" in a newspaper ad campaign.
- Not using new updates to dental procedures or expanded technical skills.
- Degrading other dentist's work or dental treatment plan.
- Discussion of other dentist's fees.

Illegal Actions:

- Performing an expanded function that has not been assigned to dental support staff in your state.

- Postdating or predating insurance or patient records and files.
- Causing injury to a patient because of negligence.
- Use of or addiction to drugs.
- Not renewing the required license or certification.

A decision is ethical if:

- it enhances self respect,
- it develops personal integrity and integrity in relations,
- it builds genuine confidence in self and others, and
- it maintains confidentiality and exhibits respect.

A decision is not ethical if:

- it brings harm to others,
- it causes an illegal action,
- people are exploited or belittled, or
- people are treated as an inhuman object.

Conduct may be unethical and still be legal, but conduct cannot be illegal and still be ethical.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written unit evaluation. A score of 80 percent indicates you have mastered this material and may proceed to the next unit.

Lesson 3: Ethical Standards

Activity Sheet

1. List four actions that would be considered unethical in a dental office.

   a. _____

   b. _____

   c. _____

   d. _____

2. List three actions that would be considered illegal in a dental office.

   a. _____

   b. _____

   c. _____

Clinical/Laboratory Activities

1. Discuss the following situations and questions with members of a dental staff at a local dental office or the instructor where you are attending school.

   a. If you are working in a dental office and you suspect that the receptionist is falsifying insurance records, what do you think you should do in this situation?

   b. By law a dentist is not required to accept all patients. Therefore, the choice to accept or not to accept a charity patient or AIDS patient is an ethical (rather than legal) question. What do you think about this situation?

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: The Dental Profession Rating _____

Comments: _____

_____

_____

Activity Sheet #2: Personal Grooming Rating _____

Comments: _____

_____

_____

Activity Sheet #3: Ethical Standards Rating _____

Comments: _____

_____

_____

Unit Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit II

Basic Office Procedures

The dental aide may be called upon to occasionally answer the telephone within a dental office, confirm appointments for the next day's schedule, or file patients' charts. It is important that these tasks be carried out in a professional manner. Unit II includes information on how to properly perform each of these tasks and how to effectively communicate with patients and staff members.

Unit Lessons

Telephone Techniques and Appointment Confirmations

Alphabetical Filing

Effective Communication

Lesson 1:
Telephone Techniques and Appointment Confirmations

Objectives:

A. Identify the proper steps to answer a dental office telephone.

B. Identify techniques that may be used for placing callers on "hold."

C. Recognize incorrect telephone techniques.

D. Correctly fill out a message slip.

E. Describe the proper method for confirming dental appointments.

F. Match key terms with their meanings.

Key Terms:

- Diagnosis
- Unethical
- Diagnostic Tools

Effective Telephone Techniques

If the dental aide is called upon to answer the telephone within the dental office, he/she must remember to be pleasant at all times. The dental aide should identify the dental office and him/herself by first name. For example, a proper telephone address should include the following greeting: "Good Afternoon, Dr. Doe's office, this is Susan." Remember to smile when you answer the telephone; although the caller cannot see your smile, it will affect the sound of your voice.

Phone calls must always be answered on the first or second ring if possible.

Speak clearly and listen carefully to what the caller has to say. Do not put a caller on" hold" unless it is absolutely necessary. But if you must do so, inform the caller that you are putting him/her on "hold" and about how long it will be before you return. For example, "Mr. Jones, would you please 'hold' for about two minutes while I check with Dr. Doe?" Do not place a caller on hold until he or she agrees to wait.

Make certain that you do not leave a caller on "hold" longer than the length of time you mentioned. If the doctor is busy and you cannot speak with him/her within two minutes, take your caller off "hold" and explain the situation. It may be necessary to return the call later, but you can give the caller a choice: "Thank you for waiting, Mr. Jones. Dr. Doe is with a patient right now. Would you like to 'hold' for five minutes longer, or may I call you back before two p.m.?"

When you take a caller off "hold," thank him/her for waiting. If the caller expects a return call from you or another staff member, indicate the latest time the call will be returned. If you cannot guarantee the caller a return call, do not mention it. For example, if a salesperson wants to speak with the doctor personally, the doctor may not feel obligated to return the call. In such a case, you may say, "Thank you for waiting, Mrs. Smith. Dr. Doe is with a patient at this time. Would you like to call again later?"

Any caller who wishes to speak with the doctor should be placed on "hold" while the aide checks to see if the doctor is available to take the call.

It takes experience in each different dental office to learn how the doctor wants return calls to be handled. The dental aide should make an effort to learn common office practices before assuming the responsibility of answering the phone.

Proper grammar and English usage are vital when speaking with phone callers. Because the caller cannot see you, his/her only impression of you, and the dental office in which you are working, is the sound of your voice. If you use improper English, you are giving the caller an undesirable image of the office. For example, if you were to say, "We don't have no file on you, Miss Taylor. When was the last time Dr. Doe seen you?" the caller would probably have a lower opinion of your level of knowledge than if you said, "We cannot seem to locate your records, Miss Taylor. Can you remember the last time you were seen in our office?"

Taking Messages

If the caller cannot speak with the person he/she called, fill out a phone message slip with the time and date of the call, the caller's name, and any message the caller leaves. If the caller would like a return call before a certain time, indicate so on the message slip, including a phone number where the caller can be reached.

Following are the exact items that should be included on a message slip:

- The name of the person with whom the caller wanted to speak,
- The current date,
- The hour and minute that the call was received,
- The correctly spelled name of the caller (ask for correct spelling),
- Information regarding who the caller is (a patient, salesperson, friend, etc.),
- The subject of the call (a business meeting, patient who has a question, etc.),
- Any message the caller wants to leave,
- Your name (the person who took the call), and
- Indication of whether the caller expects a return call or will call later. If a caller does not volunteer the information you need, ask politely, and make certain to tell the caller you will see to it that the message is received.

Fig. 2.1 - Standard Message Slip

TO: _____

DATE: _____ TIME: _____

BY: _____

☐ Please return call ☐ Telephoned

☐ Will call again ☐ Returned your call

Name of caller: _____

of: _____

Phone: _____

Message: _____

_____

_____

_____

Fig. 2.2 - Example of Message

TO: *Dr. Doe*

DATE: *Today* TIME: *10:40 A.M.*

BY: *Susan*

☐ Please return call ☒ Telephoned

☒ Will call again ☐ Returned your call

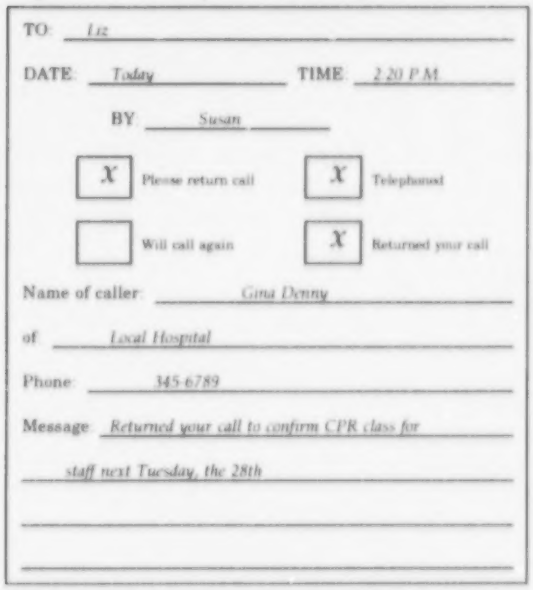
Name of caller: *Gail Heckman*

of: *County Sheriff's Office*

Phone: *678-9101*

Message: *Would like to know if you will buy tickets to the Sheriff's fundraising Bar-B-Q*

Fig. 2.3 - Example of Message



TO: *Liz*

DATE: *Today* TIME: *2:20 P.M.*

BY: *Susan*

[X] Please return call [X] Telephoned

[ ] Will call again [X] Returned your call

Name of caller: *Gina Denny*

of: *Local Hospital*

Phone: *345-6789*

Message: *Returned your call to confirm CPR class for staff next Tuesday, the 28th*

When answering the telephone, the dental aide must never express anger or frustration with the caller, even if the caller is rude or angry. Responding with anger worsens the situation, and reflects poorly on the professionalism of the office.

The dental aide should never make appointments for patients within the dental office. If a patient calls for an appointment, allow the patient to speak with a staff member who is trained in appointment scheduling. Every dental office works on a different time schedule for each procedure. An improperly scheduled appointment can disrupt an entire day's schedule.

The dental aide must NEVER attempt to guess what might be wrong with a patient over the telephone. It is illegal for the aide to make a **diagnosis** (identify a disease from its signs and symptoms), and it is **unethical** (not conforming to professional standards of conduct) to lead a patient to think that the doctor or his/her staff can determine what is wrong with a patient without a personal examination and the use of other **diagnostic tools** (methods and procedures used to make a diagnosis) such as x-rays. If a patient asks what you think may be wrong, politely explain it is up to the doctor to make that decision. The dental aide should assure the patient that his/her symptoms will be relayed to the doctor. The patient should then be referred to a qualified staff member to schedule an appointment.

The dental aide must never suggest patients take aspirin or any medication unless directed to do so by the doctor.

Appointment Confirmations

Many dental offices prefer to call patients the day before they are scheduled for an appointment. This practice limits the number of missed appointments by gently reminding patients of their appointment date and time. Missed appointments result in a loss of time and money for the dental office.

Most patients appreciate a confirmation of their appointment, especially if it has been a long time since they made the appointment.

If it turns out a patient cannot keep his/her dental appointment, the office will have a chance to try to fill that time slot if notified during the confirming phone call. The patient is also given the opportunity to reschedule the appointment with a staff member qualified to make appointments.

Appointments are confirmed by phone on the last working day before the scheduled appointment. If a patient works nights and cannot be disturbed at home during the day or cannot take phone calls at work, a note should be made on the patient's chart. Appointments for patients under the

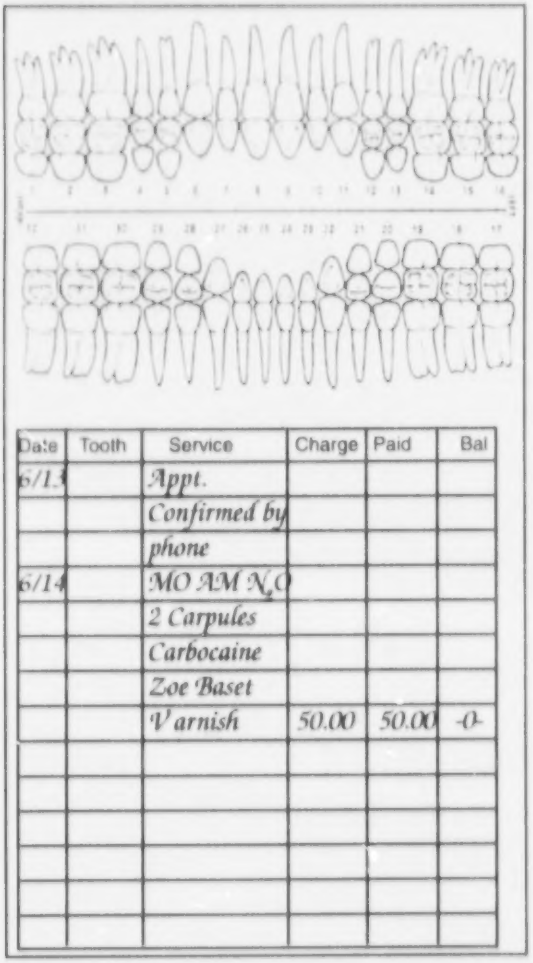
age of sixteen should be confirmed with a parent.

When confirming an appointment, the dental aide should identify himself/herself and state that he/she is confirming the patient's appointment, along with the day and time of the appointment. One should never state the call is to remind the patient; some patients resent being "reminded" to come to the dentist. The following is an example of a proper confirmation. "Hello, Mr. Johnson, this is Susan from Dr. Doe's office. I am calling to confirm your appointment with Dr. Doe tomorrow afternoon at 1:00 p.m."

Once the patient confirms he/she will keep the appointment, indicate that the staff looks forward to seeing him/her the next day at one o'clock. The dental aide should then make a notation on the next day's schedule that the appointment was confirmed.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Fig. 2.4 - Confirmation Noted on Patient's Chart



Date	Tooth	Service	Charge	Paid	Bal
6/13		*Appt.*			
		Confirmed by			
		phone			
6/14		*MO AM N_2O*			
		2 Carpules			
		Carbocaine			
		Zoe Baset			
		Varnish	*50.00*	*50.00*	*-0-*

Lesson 1: Telephone Techniques and Appointment Confirmations

Activity Sheet

1. List three things the dental aide should remember to do when placing a caller on hold.

   a. _____

   b. _____

   c. _____

2. List three advantages of confirming dental appointments for the dental office or the patient.

   a. _____

   b. _____

   c. _____

3. When confirming an appointment for Ms. Tracy, should the dental aide tell the patient that he/she is calling to remind her that she has a dental appointment the next day? Explain.

   _____

   _____

4. Fill in the message slips below for each phone call.

a. Dr. Joe Jackson called the office at 9:15 a.m. to cancel a lunch meeting with Dr. Doe on Friday at 11:00 a.m. He would like the doctor to return his call at his home number (123-4567) before noon tomorrow.

b. Ms. Katy Lee of Ed's Dental Supplies called at 1:00 p.m. to talk with Liz, the office manager. If Liz does not return her call by 5:00 p.m., Ms. Lee will be at Dr. Doe's office 11:00 a.m. Friday to demonstrate a new product. Phone number is 456-7890.

TO: _____

DATE: _____ TIME: _____

BY: _____

☐ Please return call ☐ Telephoned

☐ Will call again ☐ Returned your call

Name of caller: _____

of: _____

Phone: _____

Message: _____

_____

_____

_____

TO: _____

DATE: _____ TIME: _____

BY: _____

☐ Please return call ☐ Telephoned

☐ Will call again ☐ Returned your call

Name of caller: _____

of: _____

Phone: _____

Message: _____

_____

_____

_____

Clinical/Laboratory Activities

1. After getting approval from your clinical supervisor, help the receptionist answer the phone and take messages. Remember to find out how the dental office wants the phone answered.

Lesson 2: Alphabetical Filing

Objective:

File patient charts alphabetically.

Key Terms:

- Nothing Before Something Rule
- Out Guide

In a busy dental office, patient files and records are constantly being pulled and returned to the filing stacks; therefore, there is almost always filing that needs to be done. The dental aide will most likely help with this task, so this lesson will cover the basic rules for alphabetical filing.

Alphabetical Filing

Although filing may seem a simple task, this process has basic rules that must be followed so records are not misfiled. Misfiling can result in extreme difficulty in retrieving information.

All patient charts and records are filed alphabetically by the patient's last name, then by the first name. For example, if there are three members of the Smith family, Bob Smith is found in the files before Brad Smith. Even though both their first names begin with "b", the second letter in Bob's name comes before the second letter in Brad's name alphabetically. Brad's chart is in front of Carol Smith's chart because "b" comes before "c" in the alphabet.

The Smith files are in front of the Smyth files because "i" comes before "y" in the alphabet.

Sometimes you come across two different patients with the same name. If this happens, the dental aide should refer to the middle names of the two patients. For example, Fredia H. Jones is filed in front of Fredia M. Jones because "h" comes before "m" in the alphabet.

If one Fredia Jones does not have a middle name, then the **Nothing Before Something Rule** takes effect. If the only difference in two names is the lack of a middle name or initial, then the name lacking that part is filed first. In this particular case, Fredia Jones is filed before Fredia M. Jones.

The same applies to William T. Dent and William T. Dent, Jr. The first William T. Dent does not have "Jr." in his name, and is, therefore, filed first.

Some names can be tricky to file. For example, a common mistake is to misfile the names "Schaeffer," "Schaefer," "Shaffer," and "Shaeffer" because the arrangement of the letters is so similar. The aide must remember that if the first letter of the last name is the same, we refer to the second letter, then the third, and so on. See if you can arrange the four names listed above alphabetically.

1. _____
2. _____
3. _____
4. _____

You should have arranged the names in this order:

1. Schaefer, because it is identical to Schaeffer until the seventh letter. At that point, "e" comes before "f" alphabetically.
2. Schaeffer, because "c" comes before "h", which is the second letter of the remaining names.

3. Shaeffer, because the fourth letter of this name is an "e", and the fourth letter of the remaining name is an "f."
4. Shaffer.

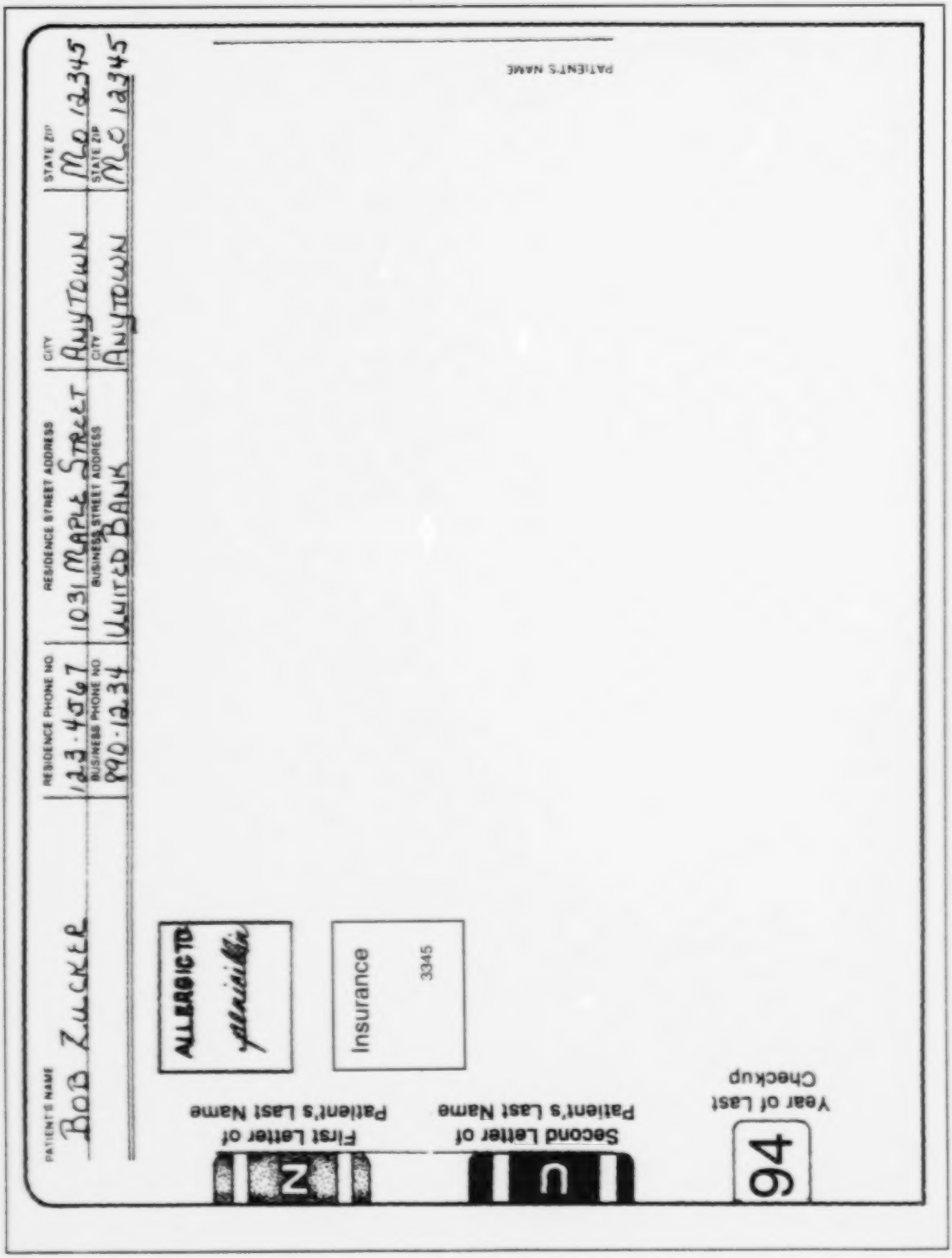
One hint that makes filing less time consuming is to arrange the files in roughly alphabetical order by last name before you begin filing. If you begin filing with the chart of Lisa Ashcraft and proceed through the stack until the last chart of Brenda Williams, you will not need to return to the "As" to file Mark Ashcraft's chart.

Another good idea is to use an **out guide** to mark the place where a file belongs if it is only going to be removed from the filing stacks for a short period of time. An out guide could be a piece of red paper stuck in the space where the file is missing. You could even pull the file in front of the missing file out of its place slightly, then you would know that the file you have removed belongs directly behind the protruding file. The out guide is like a book mark for the filing stacks.

Most dental offices use a system to color code the files with a sticker that is marked with the first letter of the last name, and sometimes another one under it that indicates the second letter of the last name or the first letter of the first name. These stickers are visible on the charts that are already filed and save time that would have been used just looking for where the "Os" end and the "Ps" begin. See example on the next page.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Fig. 2.5 - File Folder



Lesson 2: Alphabetical Filing

Activity Sheet

Arrange the following names in alphabetical order on the lines provided.

Louis Wilson	Karen Dent	Joanie Jones	William T. Dent
William Dent	Mary Hill	Lou Wilsen	Shelley Lyle
Kathy Brown	Joan Jones	Cindy Schaefer	Heather Rackers
Cindy Schaeffer	Cathy Braun	Leela Dent	Syd Anderseon
Jon Cunningham	Lois Wilson	Mike Hill	Shelly Lyle

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Clinical/Laboratory Activities

1. After checking with your supervisor, check out the filing system used in your clinical site. If possible, assist with filing of patient charts and other correspondence.

Lesson 3:
Effective Communication

Objectives:

A. Identify the proper method for greeting patients and visitors.

B. Identify methods that can be used to calm anxious patients.

C. Identify methods that can be used to calm fearful children.

D. Identify how to avoid and deal with conflicts among staff members.

Key Terms:

- Handpiece
- Bur
- Pain Perception

The field of dentistry involves working very closely with others. The dental aide will be expected to deal with patients and the dental staff on a thoughtful but professional level. This lesson will provide some pointers on how to make patients as comfortable as possible, as well as how to communicate effectively with staff members.

Greeting Patients and Visitors

Some member of the dental staff should acknowledge people as they enter the reception area. Every person who is addressed as he/she enters the office should be greeted with a smile. If the dental aide does not know the patient or visitor, the aide should politely ask how he/she can help.

Any patient or visitor with a physical impairment such as blindness, deafness, or being in a wheelchair, must be treated with dignity, but the impairment must usually be addressed in order to provide dental care. Most offices have policies for dealing with patients with physical impairments, and the aide should be trained in these policies. A good rule of thumb is to always treat others the way you would want to be treated if you were in their position.

Fig. 2.6 - Patient with Special Needs

Patients or visitors who have an appointment should be advised as to how long it will be before they are escorted to the treatment or consultation area. If their wait will be longer than they were first told, the aide should tell the patient or visitor approximately how much longer it will be. The receptionist or other members of the staff should be able to determine this information for the aide. People do not enjoy having to wait to see the doctor, and they appreciate knowing how long their wait will probably last, instead of being left to wonder if they have been forgotten.

A visitor without an appointment should be asked to take a seat while the aide checks if the doctor or staff member he/she has come to see is available. If the visitor cannot be seen by the doctor or staff member, the aide should provide paper, pen, and an envelope so the visitor can leave a message.

Communicating with Patients

It is important to remember that the dental team is working in a very intimate area of the patient's body and that the patient cannot really see what is being done.

Patients will often watch the facial expressions of the staff members during procedures. If the dental aide is in the operatory during patient treatment, the aide must maintain a look of composure. When dental procedures appear painful, or maybe even a little graphic, it is easy for those feelings to show. Patients are scared by facial expressions that indicate something may be going wrong. After all, if the "professional" staff members think the procedure is scary looking, it must be awful! The aide must remember patients are numb and cannot feel what is happening, and the doctor and assistant are highly trained and very capable. When working with patients, the aide should always tell the patient what he/she is doing. For example, if the dental assistant or doctor trains the aide to perform simple procedures, the aide should not simply approach the patient and perform the task without first explaining what is happening. If the aide is fitting an impression tray in order to determine the correct size to take an impression, the aide could say, "Mr. Jones, I am going to try this tray in your mouth to see if it is comfortable for you."

Explanation is especially important when working with patients who are physically or mentally impaired. Imagine how scary it would be for a blind patient to have something placed in his/her mouth without realizing there was anyone in the room!

It is a good idea to check with patients during procedures, just to let them know you are thinking of them as well as their teeth. Do not ask a question while the **handpiece** (the instrument used to remove decay from teeth and prepare them for restoration) is in the patient's mouth, however. He/She may nod or try to talk, causing the handpiece to slip and damage tissue. Perhaps while the doctor is changing **burs** (the small cutting device that is rotated rapidly by the handpiece in order to remove decay or tooth tissue when restoring teeth), the dental aide could say, "Are you doing all right, Ms. Carney?"

Do not ever ask the patient if he/she is in "pain" or whether something "hurts." The patient will think it is supposed to hurt, and that belief will affect his/her **pain perception** (the level of discomfort a patient believes that he/she is experiencing). Ask if the patient is uncomfortable - this word does not trigger a pain response in most patients. Sometimes patients "perceive" pain, or believe something hurts just because it is an unusual sensation. For example, during a tooth extraction, the patient will be completely numb, but can believe the pushing or pressure they feel is pain. In fact, it is no more painful than pushing gently on an arm or leg, but the patient is not used to such feelings in the mouth and "perceive" them as pain. If a dental team member explains this to the patient before the extraction, he/she is often much more calm during the procedure.

The dental aide should never lose patience with a patient who is fearful, whether a child or adult. Some adults have had

frightening experiences at the dentist when they were young and still feel some of that anxiety. If the dental aide takes the time to explain what the patient can expect to feel, exactly what will be done in simple terms that are not alarming, and how long it will take, the patient will not only be grateful but will not grow tense during the procedure because he/she knows what to expect.

Place a clean patient napkin over the syringe and any sharp looking instruments before seating the patient. Nobody likes to imagine what the doctor plans to do with all that scary stuff!

There are some words and phrases that should never be used within the hearing range of patients. They are listed below with suitable alternatives:

Never Say This:	**Say This Instead:**
Needle	Syringe
Shot	Injection
Drill	Handpiece
Hurt or Pain	Discomfort
Pull a Tooth	Extraction
Cut a Prep	Prepare the Tooth

In addition, the aide should never ask a patient if he/she gags easily. Do not even use the word, "gag." Patients believe if YOU think they are going to gag, then this procedure must cause everyone to gag, and the patient will do just that - gag.

Dealing with Young Patients

A child's first visit to the dentist will usually affect how he/she views dentistry and oral health for a long time to come. Most children are very fearful on their first few visits, and the dental aide can be valuable in helping children enjoy their visits to the dentist as much as possible.

The aide may allow the child to run the chair controls once or twice so he/she can see how the chair moves. Another thing children enjoy learning about is the three-way, or air-water syringe. If the aide shows the child the handpiece sprays water to wash the cavities out of his/her teeth, the young patient can better understand why you use it. The oral evacuator is often called the "vacuum sweeper" to suck up all the extra water that comes from the "tooth washer." One thing you never show patients, however, is the syringe used to numb them. Many patients never even realize they have had an injection of "sleepy juice" until they begin to feel numb. Once patients do begin to feel numb, the dental aide should tell them not to chew on their numb tongue or lip; it will hurt later if they bite themselves!

The dental aide should try to squat down to talk to a young patient, or place the chair high enough so the patient is almost eye-level with the aide. Until you become friends with your patients, you are a stranger. If you tower over them, they may be afraid of you. Answer any questions a patient may have as honestly as possible without saying anything that could scare the child.

Some dentists prefer that a child's parents or guardians remain in the reception area during treatment on the child. The dental aide may be asked to explain to the parents that sometimes children have trouble listening to directions from the dental team when the parent is in the room, because the child's attention is divided between two authority figures. Also, sometimes the child gets the idea the parent is in the room because he/she does not trust the dental team and is there to protect the child. Most parents and guardians understand and agree to wait in the reception area.

Communicating with the Doctor and Staff

The dental team members not only work closely with patients all day long, they also work in a confined space with each other.

It is important for staff members to express themselves in a mature and polite fashion whenever conflicts arise. Many times, the source of the problem is not a lack of consideration for others, but a matter of realizing that certain practices normal to one person may be annoying to another.

When a staff member is in the wrong, an apology and a promise to be more considerate in the future is in order.

If a staff member feels he/she has been wronged, he/she should address the issue with only the person involved, not others, and try to remain calm and polite, even if the other person gets angry. One feels rather foolish yelling at someone who refuses to yell back and remains calm.

Communication between staff members should be open but respectful. The Golden Rule applies in the workplace as well as everywhere else. (Golden Rule: Do unto others as you would have them do unto you.)

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written unit evaluation. A score of 80 percent indicates you have mastered this material and may proceed to the next unit.

Lesson 3: Effective Communication

Activity Sheet

1. What can be done in order to make the patient more comfortable while waiting to be escorted to the treatment room?

   _____

   _____

2. If an unscheduled visitor cannot be seen by the doctor, what should the dental aide do?

   _____

   _____

3. List three tactics that can be used to help calm an anxious patient.

   a. _____

   b. _____

   c. _____

4. List three tactics that can make young patients less fearful.

   a. _____

   b. _____

   c. _____

5. If the dental aide feels that he/she has been wronged by a staff member, what tactics can be used to resolve the conflict?

   _____

   _____

   _____

6. Provide suitable alternative phrases for these terms:

   Drill _____ Shot _____

   Pain or Hurt _____ Needle _____

Clinical/Laboratory Activities

1. At your clinical site, observe how dental personnel communicate with patients. Also, check with your clinical supervisor about office policies that dictate special techniques to be used when communicating with a person who is hard of hearing or who is blind.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Telephone Techniques and Appointment Confirmations Rating _____

Comments:_____

_____

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Activity Sheet #2: Alphabetical Filing Rating _____

Comments:_____

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Activity Sheet #3: Effective Communication Rating _____

Comments:_____

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Unit Evaluation Score _____

Additional comments:_____

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Teacher Signature_____Date_____

Student Signature_____Date_____

Unit III

Infection Control and Occupational Safety

After completing this unit, you should be able to identify the methods by which pathogenic microorganisms are transmitted in a dental office. Techniques for infection control for the dental auxiliary and the preparation of instruments for sterilization and disinfection are a must. Dental workers must intelligently and conscientiously carry out all procedures to control contamination to prevent the spread of disease throughout the dental office. The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has monitored and helped improve safety conditions in the workplace. OSHA's Occupational Exposure to Bloodborne Pathogens and Hazard Communication Standard are explained.

Unit Lessons

Infection Control

Instrument Preparation, Disinfection, and Sterilization

OSHA Bloodborne Pathogens Standard

OSHA Hazard Communication Standard

Lesson 1: Infection Control

Objectives:

A. Identify the two primary methods or modes by which pathogenic microorganisms are transmitted.

B. List five dangerous pathogenic microorganisms that may be transmitted within a dental office.

C. Identify five personal protective barriers or procedures the dental team member must employ to prevent cross contamination.

D. Wash hands according to steps of procedure.

E. Don and remove gloves according to steps of procedure.

F. Don and remove mask according to steps of procedure.

G. Don and remove gown according to steps of procedure.

H. Match key terms with their definitions.

Key Terms:

- Infectious (ĭn-fĕk´shŭs) Disease
- Pathogens (păth-ŏ-jĕnz)
- Cross Contamination
- Viral (vī rŭl) Hepatitis (hĕp˝ ah-tī´tĭs)
- Jaundice (jawn´ dĭs)
- Human Immunodeficiency (ĭ-mū-nō-di-´fish-ŭn-sē) Virus (HIV)
- Acquired Immune Deficiency Syndrome (syn´ drōm)(AIDS)
- Tuberculosis (tū-bĕr´kū-lō´sĭs)(TB)
- Mycobacterium (mī-kō-bak-´tir-ē-ŭm) Tuberculosis
- Herpes (hĕr´ pēz) Simplex (sĭm plĕx) Viruses
- Treponema (trĕp˝ ō-nē´ mah) Pallidum
- Syphilis (sĭfĭ- lĭs)

An **infectious disease** occurs when a microorganism in the body multiplies and causes damage to the tissue. The microorganisms that cause infectious diseases are called **pathogens**.

Although microorganisms can be present almost anywhere in the dental office, microorganisms of greatest concern are in the mouths of patients. It is not possible to accurately detect which patients may indeed be harboring these pathogens; therefore, infection control procedures must be applied during care of <u>all</u> patients.

It is important that members of the dental health team have an understanding of infection control so that they may intelligently and conscientiously carry out the steps necessary to control **cross contamination** (passing germs from one person to another) and prevent the spread of disease throughout the dental office.

Modes of Disease Transmission

Two primary methods or modes by which diseases are transmitted in the dental office are by contact and the airborne method.

Contact Transmission is further divided into 1) direct contact, 2) indirect contact and 3) droplet contact.

<u>Direct contact route</u> - Contacting or touching soft tissue or teeth in the patient's mouth may result in direct contact with microorganisms. This gives micro-organisms an opportunity to penetrate the body through small breaks

Fig. 3.1 - Direct Contact Route

or cuts in the skin around the fingernails of ungloved hands. Transferring microorganisms from an infected patient to other patients or dental workers is the main source of cross contamination in the dental office.

Indirect contact route - The indirect contact route is contact with items contaminated with a patient's microbes. Indirect contact can result from injuries with contaminated sharps (e.g. needles) and contact with contaminated instruments, equipment, and surfaces. These items may carry a variety of pathogens because of the presence of blood or saliva from a patient.

Fig. 3.2 - Indirect Contact Route

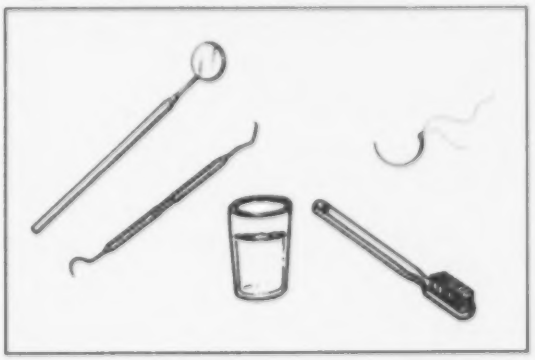
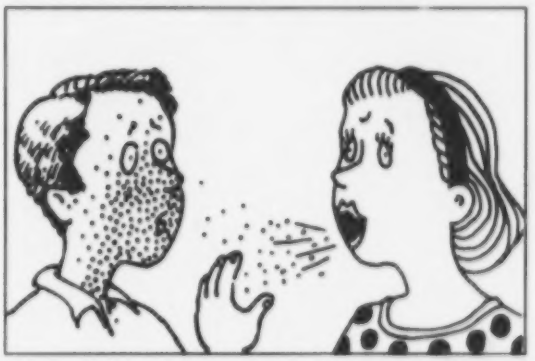


Fig. 3.3 - Droplet Contact Route



Droplet contact route - Transmission occurs when someone coughs or sneezes or creates large droplet sized particles during a dental procedure. The microorganism is carried only a short distance (within three feet). Many times droplet contact is confused with airborne transmission in which the particles can travel great distances. In the dental office, coughs, sneezes, and sprays from dental handpieces are the main ways microorganisms are transmitted through droplet contact.

Airborne Transmission occurs when the residue of evaporated droplets, known as dust particles, containing infectious microorganisms are disseminated into the air. These microorganisms can stay suspended in the air for a long time and can travel great distances. They can be inhaled or deposited in an open wound. Chicken pox and Tuberculosis are two diseases that can be spread by the airborne route.

Potentially Dangerous Pathogenic Microorganisms

Hepatitis B virus is a bloodborne microorganism usually transmitted by direct contact with infected body fluids. **Viral hepatitis**, the disease associated with the Hepatitis B virus, is an

inflammation of the liver. Hepatitis B infection may result in various clinical symptoms, including fever, nausea, joint pain, and **jaundice** (yellowing of the skin and whites of the eyes).

Human Immunodeficiency Virus (HIV) is the microorganism that causes the disease **acquired immune deficiency syndrome** (AIDS). AIDS is characterized by an irreversible suppression of the immune system. It compromises the ability of the immune system to fight off opportunistic infections. An opportunistic infection is one which would normally be controlled by the immune system (such as a cold or pneumonia) but cannot be controlled because the system is not working properly.

Mycobacterium Tuberculosis is the microorganism associated with the disease **tuberculosis (TB)**. This microorganism is usually found in the lungs, producing swelling which results in difficulty with breathing. Signs of TB take several months to appear. They include tiredness, weight loss, low grade fever, night sweats, and finally, a chronic cough.

Herpes Simplex Viruses may cause infection of the mouth, skin, eyes, and genitals called herpes. Many lesions, sometimes called fever blisters, appear on the lips. They contain the virus which may be spread to others by direct contact. When lesions are present, the patient may be asked to reschedule his/her appointment to a time when the lesions have healed. Gloves protect the dental worker's hands against infection through lesions on a patient's mouth.

Treponema Pallidum is the microorganism associated with **syphilis**. About 10 percent of syphilis cases first occur in the mouth in the form of a lesion called a primary chancre, an open lesion frequently on the tongue or lips. Long-term effects of syphilis eventually cause the formation of gummas and cardiovascular lesions, which may be fatal.

NOTE: Syphilis and herpes simplex virus are venereal diseases that may be contracted through the oral cavity.

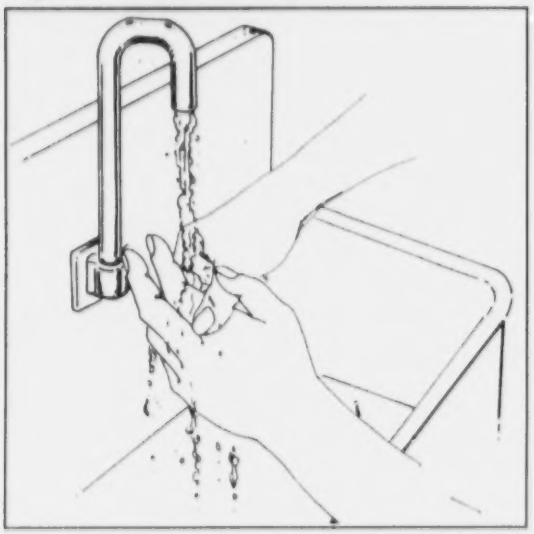
Hepatitis B, acquired immune deficiency syndrome, tuberculosis, herpes simplex virus, and syphilis are five of the potentially dangerous pathogenic microorganisms that can be transmitted in a dental office. Steps taken to prevent cross contamination include the use of barrier techniques to prevent either the staff or the patient from coming into contact with the pathogens. Barrier techniques include the routine use of gloves, masks, protective eyewear, and protective clothing or uniforms.

Personal Protective Equipment

Most routine tasks in the dental office involve contact with a patient's body fluids such as saliva or blood, along with other body substances such as bone, tooth, or fleshy tissue. These fluids and substances may transmit diseases. Dental office employees must protect themselves from contact with these fluids and substances. The technique required by Occupational Safety and Health Administration (OSHA) is the use of personal protective equipment which acts as a barrier between the employees and potentially infectious material.

Handwashing - Handwashing is the number one, most important personal protective barrier and prevention of cross contamination. The inside of gloves are warm, dark, and moist, therefore, an ideal breeding ground for bacteria that may already be present. Hands should be washed thoroughly with an antiseptic soap

Fig. 3.4 - Handwashing



before gloving. When the gloves are removed, the dental aide must wash his/her hands carefully with antiseptic soap to remove the bacterial buildup that may have occurred.

Steps of Procedure for Washing Hands:

1. Remove watch and/or rings, roll up sleeves. (Wash watch and rings if they have come into contact with contaminated materials.)
   NOTE: Place watch and/or rings on clean paper towel.
2. Turn on water with knee, foot, or hand controls, adjust temperature so it is comfortable for you.
   CAUTION: Do not turn controls during procedure.
3. Wet hands thoroughly, including and 2-3 inches above wrists; hold hands with wrists lower than elbows and fingertips pointed downward.
4. Apply generous amount of soap to hands. If using bar soap, rinse it well before lathering and before returning it to the dish.
5. Scrub hands for at least 15 seconds:
   a. Wash palms and back of hands with at least ten circular motions.
   b. Wash fingers and between fingers with at least ten circular motions.
   c. Wash wrists with at least ten circular motions.
6. Rinse wrists and hands well; keep wrists lower than elbows.
7. Dry hands well with paper towel or fresh clean towel, using one for each hand.
8. Turn off faucet with dry paper towel.
9. Discard paper towel. Be careful not to touch the part that touched the faucet.
10. Apply hand lotion if desired.

Mask - Guidelines require protective masks be worn for all procedures that can cause saliva, blood, or debris to splash back into the face or mouth. Masks are used to protect the wearer from aerosol spray from the handpiece or three-way syringe that may contain possible pathogens. Once the mask becomes wet, it should be replaced because it becomes ineffective. A new clean mask is worn for each new patient and discarded after use.

Steps of Procedure for Donning and Removing Mask:

Donning mask:
1. Wash hands.
2. Pick up mask.
3. Adjust mask over your nose and mouth.
4. Tie top string behind head.
5. Tie lower string behind head.
6. Complete patient care.
   NOTE: Replace mask if it becomes moist.

Removing mask:
7. Wash hands.
   NOTE: If wearing gloves, remove them before washing hands.
8. Untie bottom string.
9. Untie top string.

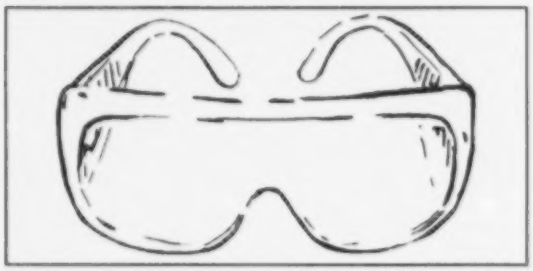
Fig. 3.5 - Masks

10. Remove mask by holding top strings.
11. Discard by dropping mask in approved container in exam room.
12. Wash hands.

Protective Eyewear - Glasses with protective side shields should be worn when there is a danger of damage to the eye from debris, such as flying amalgam scrap, or airborne spatter from the handpiece.

Gloves - Latex examination gloves are worn as protection against contact with the patient's body fluids. Gloves should be worn by all members of the dental health team when there is a possibility of contact with the patient's blood, saliva, or mucous membranes. Latex examination gloves are not sterile and are worn as a protective barrier for the wearer and the patient. Examination gloves should be discarded after each patient's visit.

Fig. 3. 6 - Protective Eyewear



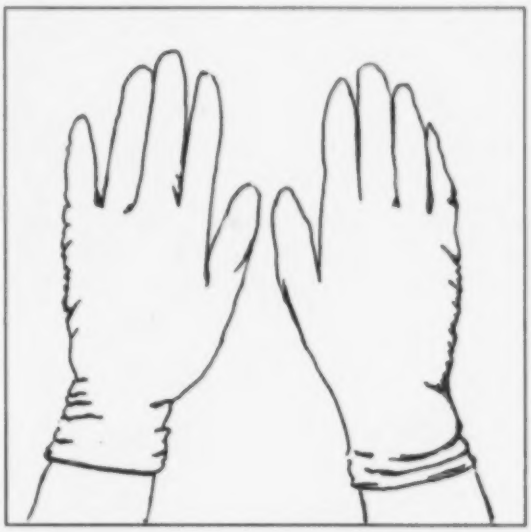
Utility or heavy duty household type gloves should be worn when handling soiled instruments and when cleaning the operatories.

Steps of Procedure for Donning and Removing Daily Care Nonsterile Gloves:

Donning gloves:
1. Wash and dry hands.
2. Remove gloves from box, one at a time.
3. Place your hand through opening and pull the glove up to the wrist.
4. Repeat with second glove.
5. Adjust gloves to cover your wrists or cuffs of gown.
6. Complete patient care.

Removing gloves:
7. Grasp one glove on the inside of wrist at 1/2 inch below band of dirty side of glove without touching your skin.
8. Pull glove down turning it inside out to cover the thumb and finger line.

Fig. 3.7 - Gloves



CAUTION: Do not completely remove the glove.

9. With covered thumb and finger, pinch second glove at inside wrist area.
10. Pull glove down until it is inside out over fingers.
11. Touch only inside surfaces of gloves and remove gloves from both hands.
12. Discard gloves by dropping them in appropriate container.
13. Wash hands.

Uniforms - Uniforms should be dry cleaned or washed in a separate load using hot water with bleach and machine dried. Disposable gowns are recommended whenever there is a chance of contamination of skin or clothing with spray or splashes of saliva, blood, or other potentially infectious materials. Hair should be kept away from the field of treatment by keeping the style short or neatly tied back.

Steps of Procedure for Donning and Removing Gown:

Donning gown:

1. Remove wrist watch and place on clean side of a paper towel.
2. Wash hands.
3. Don mask if necessary for procedure.
4. Unfold gown with opening at the back.
5. Put on gown by slipping arms into sleeves.
6. Slip fingers inside neck band.
7. Tie neck tie in back or fasten strips.
8. Grasp waist ties in front and bring to back.
9. Reach behind and overlap edges of gown.
10. Bring waist ties in front and tie.
11. Don gloves.
12. Complete patient care.

Removing gown:

13. Untie waist tie.
14. Remove gloves and dispose in appropriate container in the room.
15. Turn faucet on with clean paper towel.

Fig. 3.8 - Proper Uniform

16. Wash and dry hands.
17. Turn off faucet with clean, dry paper towel.
18. If wearing mask, remove mask holding it by ties only and discard in approved container.
19. Untie ties at neck and loosen gown at neck.
20. Slip fingers of one hand inside the cuff of the other hand.
    NOTE: Do not touch the outside of the gown.
21. Pull gown down over hand.
22. With gown-covered hand, pull gown down over other hand.
23. Fold gown away from your body with contaminated side inward.
24. Roll gown into a ball.
25. Discard gown in proper receptacle.
26. Turn on faucet with clean paper towel.
27. Wash hands.
28. Turn off faucet with clean, dry paper towel.
29. Remove watch from clean side of paper towel.
30. Dispose of paper towel in appropriate container.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 1: Infection Control

Activity Sheet

Name _____ Date _____

1. List the two (2) methods or modes by which microorganisms that cause diseases are transmitted by contact transmission and an example of each.

   a. _____

   b. _____

2. What are two (2) diseases spread by airborne transmission?

   a. _____

   b. _____

3. List the five (5) pathogenic microorganisms potentially dangerous to the dental team members.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

4. List five (5) personal protective barriers or precautions.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

5. Besides direct contact with the patient or contaminated items, how can diseases be transmitted in a dental office? _____

_____

_____

6. How can the dental aide protect him/herself from contacting infectious diseases?

_____

_____

_____

Clinical/Laboratory Activities

1. Ask your clinical supervisor to demonstrate the procedures listed below. After the demonstrations, practice the procedures.

   a. Washing hands
   b. Donning and removing mask
   c. Donning and removing daily care nonsterile gloves
   d. Donning and removing gown

Lesson 2:
Instrument Preparation, Disinfection, and Sterilization

Objectives:

A. Differentiate between disinfection and sterilization.

B. Identify three forms of heat sterilization.

C. Identify three surface disinfectants accepted by the American Dental Association and the Environmental Protection Agency, along with their properties.

D. List the recommended steps for processing instruments.

E. Bag instruments according to steps of procedure.

F. Wrap instruments according to steps of procedure.

G. Identify various surfaces susceptible to contamination during a procedure.

H. Decontaminate the operatory according to steps of procedure.

Key Terms:

- Disinfection (dĭs´ĭn-fĕk´shŭn)
- Sterilization (ster-ŭ-lŭ-´zā-shŭn)
- Autoclaving (aw´tō-klāv)
- Glutaraldehyde (gloot-ŭ-´ral-dŭ-hīd)
- Iodophors (ī-ō´dō-forz)
- Sodium (sō´dē-ŭm) Hypoclorite (hī˝pō-klō-rīt)
- Presoaking
- Precleaning

Disinfection vs Sterilization

Microorganisms can cause various diseases. It is very important to destroy these microorganisms to prevent cross contamination. **Disinfection** is a process by which microbes are destroyed. However, it does not include the destruction of viruses or spores; therefore, instruments and equipment should be disinfected only if they cannot be sterilized. **Sterilization** is the process by which <u>all</u> forms of life are completely destroyed. Sterile is an absolute term, there is no such thing as "almost" sterile.

Forms of Sterilization

There are three forms of heat sterilization most commonly used in the dental office.

<u>Autoclaving</u> - Sterilization is accomplished by superheated steam under pressure, similar to a pressure cooker. The process takes about 20 minutes after 15 pounds of pressure and a temperature of 250°F have been reached.

<u>Chemical Vapor Sterilization</u> - Sterilization is accomplished similar to the autoclave, except a chemical steam is used instead of water. The advantage of a chemical sterilizer is that it does not rust, dull, or corrode metal instruments, but adequate ventilation is essential. The process takes about 20 minutes after 15 pounds of pressure and a temperature of 250°F have been reached.

<u>Dry Heat Sterilization</u> - Sterilization is accomplished by conventional heat alone, similar to an oven. The advantage is that dry heat does not rust instruments. The disadvantage is that it is time consuming and operates at a much higher temperature. The process takes 1 hour at a preheated oven temperature of 320°F.

Metal impression trays should not be sterilized in a dry heat oven.

Surface Disinfectants

The purpose of disinfection is to reduce the number of microbes when sterilization is not possible. Disinfectants are applied to inanimate objects such as countertops, dental chairs, dental units, or other equipment that cannot be sterilized. A protective barrier such as plastic wrap or aluminum foil is recommended to cover electrical components that may be damaged by the moisture in disinfectants.

American Dental Association (ADA) and the Environmental Protection Agency (EPA) recommend various disinfecting solutions. The most commonly used ones in the dental office include:

Glutaraldehyde - It is a high-level disinfectant that is capable of sterilization if items are left in a 30-day activated solution for 6-10 hours. Glutaraldehydes produce fumes that are very toxic to tissues. Do not put your hands in the solution without wearing gloves, and always rinse the residue off the instruments before using them in a patient's mouth.

Iodophors - Iodophors are available as hard surface disinfectants and surgical antiseptic scrubs. Iodophors are inactivated by hard water, so they must be mixed with soft or distilled water. Iodophors may also corrode or discolor certain materials. Since iodophors may be inactivated by light, store them in opaque containers.

Sodium Hypochlorite - Sodium Hypochlorite is common household bleach. It can disinfect surfaces in 3 to 30 minutes. Sodium hypochlorite has a strong odor, is corrosive to some metals, caustic to skin and eyes, and may eventually cause plastic chair covers to crack. Sodium hypochlorite must be freshly mixed each day. A dilution of 1:10 to 1:100 is considered effective.

Synthetic Phenol compounds and Chlorine Dioxide are chemicals found in many surface disinfectants that are approved by ADA and EPA. There are various brand name surface disinfectants available on the market and used today.

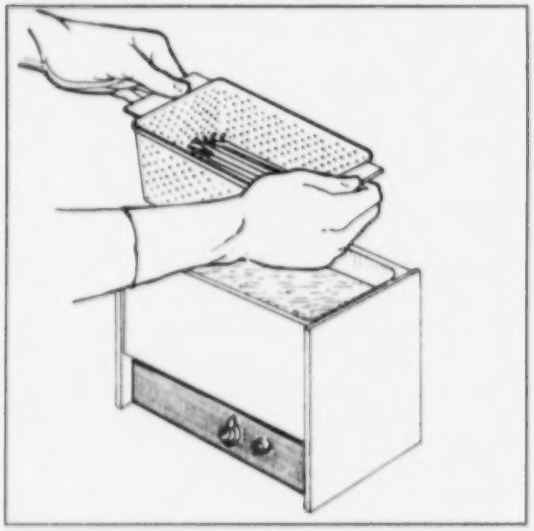
Instrument Processing

Contaminated instruments must be handled very carefully to avoid cuts and punctures. Always use personal protective equipment including nitrile or utility gloves, mask, and protective eyewear. Instruments go through several processes before they are used: presoaking, precleaning, drying and lubricating, bagging or wrapping, sterilizing, and storage.

Presoaking - If instruments cannot be cleaned soon after use, place them in a holding presoak solution to prevent blood and saliva from drying on them. Presoaking also prevents airborne transmission of microorganisms.

Precleaning - Ultrasonic cleaning effectively removes debris from instruments through the use of sound waves. Ultrasonic cleaning, compared with manual scrubbing of instruments, reduces direct handling of contaminated instruments and the chance for cuts or punctures for the operator. Instruments are placed in the ultrasonic cleaner basket and submerged in the solution and run for approximately five minutes. After cleaning, the instruments (still in the basket) are removed and rinsed under

Fig. 3.9 - Ultrasonic Cleaning



running water to remove all the cleaning solution. Manual scrubbing of instruments is not recommended because of the danger of injury. However, an ultrasonically cleaned instrument may still need additional hand cleaning to remove stubborn debris or cement from it. Most handpieces cannot be ultrasonically cleaned and must be hand scrubbed.

Drying and lubricating - After the instruments have been rinsed, they should be placed on a dry paper towel and a second towel should be used to pat or roll them dry. If the instruments are wet, they could accidentally tear the paper package during packaging. Manufacturers of many hinged instruments and dental handpieces recommend lubricating them prior to sterilization. Always check with the manufacturer's recommended procedures.

Bagging or wrapping instruments - Bagging instruments before sterilizing them prevents them from becoming contaminated after sterilization, during storage, or when taking them chairside into the operatory. Most dental offices bag their instruments in pouches (Figure 3.10). Pouches are handy because complete tray

Fig. 3.10 - Sterilization Pouch

1 PLACE ITEM IN POUCH.
2 PEEL OFF PROTECTIVE STRIP FROM ADHESIVE BAND.
3 FOLD OVER PAPER FLAP ALONG FOLD AND PRESS DOWN FIRMLY FROM THE CENTER OUTWARDS.
ProView
Self-Sealing
STERILIZATION POUCH
ADA
Cottrell, Ltd.

Courtesy of Cottrell, Ltd.
Englewood, Colorado

sets are put in one pouch and stored for future use. Instruments should be properly prepared, placed in a bag or pouch, and labeled with:

A. type of instrument or tray set,

B. date, and

C. initials or name of the individual preparing the instruments.

The pouch or bag is then properly sealed and stored if desired. Many types of bags have colored lines that indicate or change color when sterilized.

Steps of Procedure for Bagging Instruments

1. Put on heavy nitrile or utility gloves.
2. Properly prepare instruments by presoaking, precleaning, and drying and lubricating as needed.
3. Label the bag or pouch with:

   a. name of instruments or tray setup,
   b. date, and
   c. initials or name.

4. Place instruments in bag or pouch, being careful not to allow the instruments to perforate the bag or pouch.
5. Remove the tab and seal (some bags may be self-sealing).
6. Place in proper sterilization area or sterilizer.
7. Remove gloves.

Instruments may also be wrapped. Larger complete tray setups, including the tray or surgical instruments, are the most common instruments that are wrapped. The outside wrap can then be used as a sterile barrier for the counter top and as a place to rest the instruments. Instruments should be properly prepared, wrapped, and labeled with the same information that is used on a bag or pouch.

Use only packaging materials that have been designed for use in specific sterilizers. When autoclaving, the material used to wrap or bag instruments must be porous enough to permit the steam to penetrate to the instruments. Paper, special plastic, or cloth may be used for this purpose. Aluminum foil, metal containers, and special trays may be used in the dry heat oven.

Steps of Procedure for Wrapping Instruments (Figure 3.11)

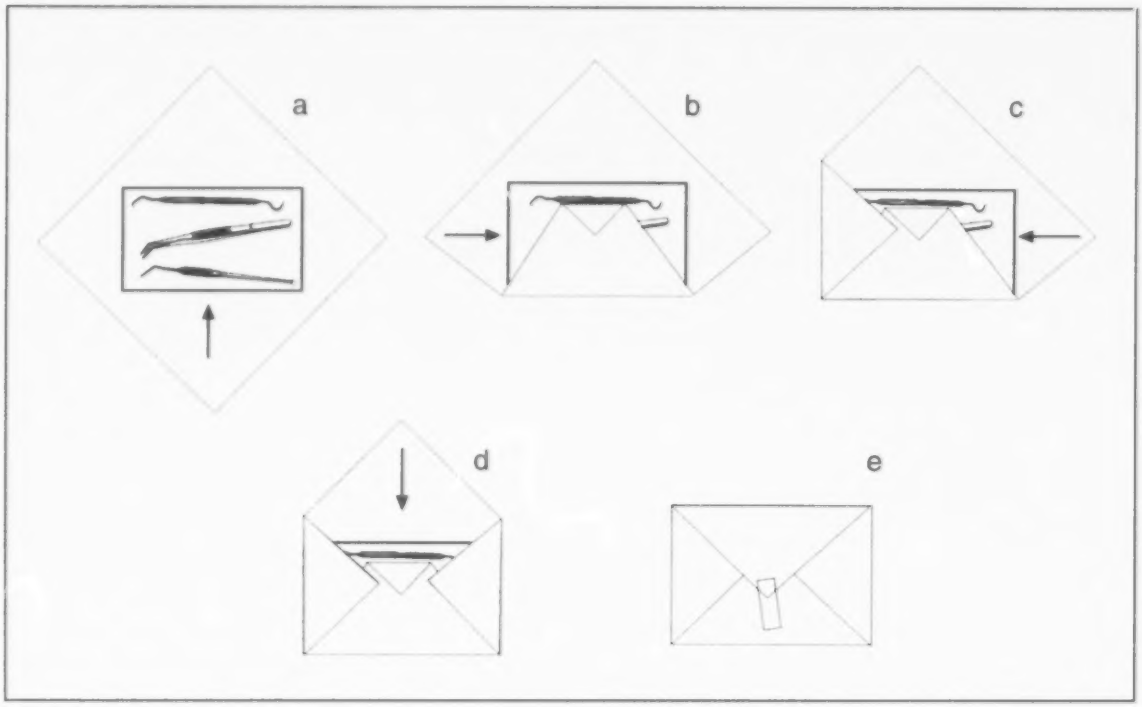
1. Put on heavy nitrile or utility gloves.
2. Properly prepare instruments by presoaking, precleaning, and drying and lubricating as needed.
3. Place instruments or tray in center of wrap. (Figure 3.11a)
4. Fold up bottom corner and turn back two inches of end. (Figure 3.11b)
5. Fold left corner over to edge of tray or instruments. (Figure 3.11c)
6. Fold right corner over to other edge of tray or instruments. (Figure 3.11d)
7. Fold top corner down to the middle and secure with tape. (Figure 3.11e)
8. Label with:

   a. name of instruments or type of tray setup,
   b. date, and
   c. initials or name.

9. Place in proper sterilization area or sterilizer.
10. Remove gloves.

Sterilizing - Precleaned, packaged instruments are now ready to be processed through a heat sterilizer. Many instruments recommend various sterilizing conditions; therefore, the type of material to be sterilized and the method of sterilization used depends on the individual office and manufacturer's recommended procedures. Whatever method you are using, spore testing or sterilization monitoring provides the guarantee of sterilization.

Fig. 3.11 - Wrapping Procedure



Storage - Store sterile packages in a dry, enclosed, low dust area. If the packages become torn or punctured, they should be rewrapped and sterilized. There is no exact time for which packages may be safely stored, so the oldest sterile packs should be used first. Instruments from sterile packs should always be placed on sterile or disposable trays at chairside.

Surface and Equipment Disinfection

Operatory surfaces and other surfaces may become contaminated and must be cleaned and disinfected between every patient visit. Heavy-duty household gloves should be worn during this time. All surfaces that were contaminated during the procedure must be disinfected to prevent cross contamination. These include:

light handles
chair switches
tubing on handpiece
tubing on 3-way syringe
tubing on oral evacuation
faucet handles
drawer handles
handpiece control switches
amalgamator buttons
all counter tops
light switch
headrest on chair
bracket table or tray
view box
X-ray tube head
X-ray controls
counter tops
handle of composite compound curing lamp
operator's cart and components
anything that was touched

NOTE: Many of these surfaces are covered with protective barriers.

Perform the following steps to decontaminate the operatory prior to seating the next patient:

Steps of Procedure for Decontaminating Operatory

1. While still gloved, remove protective barriers from equipment used during the procedure.

2. Discard all disposables.

3. Place all contaminated instruments on a tray and take them to the sterilization area.

4. Remove examination gloves and wash your hands.

5. Wearing utility gloves, thoroughly scrub the surfaces with an approved disinfectant to remove any debris.

6. Sponge or spray the surface again with the disinfectant. Leave the surface moist, and keep it moist for the manufacturer's recommended exposure time.

7. After removing your utility gloves, wash your hands.

8. Place clean barriers in the operatory.

Fig. 3.12 - Biohazard Symbol

Always dispose infectious materials and hazardous waste in special controlled trash bag that is clearly labeled "biohazard" (Figure 3.12). Discarding these substances in an inappropriate container is in violation of current laws.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 2: Instrument Preparation, Disinfection, and Sterilization

Activity Sheet

1. Place an X in front of the three (3) forms of sterilization commonly used in dental offices.

_____	Chemical vapor	_____	Autoclaving
_____	Iodophors	_____	Glutaraldehyde
_____	Sodium Hypochlorite	_____	Dry heat

2. Many inanimate objects cannot be disassembled or sterilized because of their size. List 10 of these operatory surfaces that must be disinfected to prevent cross contamination.

a.	_____	f.	_____
b.	_____	g.	_____
c.	_____	h.	_____
d.	_____	i.	_____
e.	_____	j.	_____

3. Place the following 6 steps of procedure for processing contaminated instruments in their correct order. Place a 1 by the first procedure, a 2 by the second procedure, and so on until each step of procedure through step six is identified.

_____	Storage	_____	Presoaking
_____	Drying and lubricating	_____	Precleaning
_____	Wrapping or bagging	_____	Sterilizing

4. Place the following 7 steps to decontaminate the operatory prior to seating the next patient in their correct order. Place a 1 by the first step, a 2 by the second step, and so on until each step of decontamination through step seven is identified.

_____ Remove your utility gloves and place clean barriers in the operatory.

_____ Remove protective barriers used during the procedure.

_____ Remove examination gloves and wash your hands.

_____ Discard all disposables.

_____ Wearing utility gloves, thoroughly scrub the surfaces with an approved disinfectant to remove any debris.

_____ Place all contaminated instruments on a tray and take them to the sterilization area.

_____ Sponge or spray the surfaces again with the disinfectant, keeping them moist for the manufacturer's recommended exposure time.

Clinical/Laboratory Activities

1. Locate disinfectants used in your clinical site.

2. Ask your clinical supervisor to demonstrate bagging instruments, wrapping instruments, and decontaminating operatory. Then, practice the procedures.

Lesson 3: OSHA Bloodborne Pathogens Standard

Objectives:

A. Describe the functions of the CDC and OSHA.

B. Identify nine important concepts of the Bloodborne Pathogens Standard and how dental offices must come into compliance with each part.

C. Identify key terms and their definitions.

Key Terms:

- Bloodborne Pathogens
- Occupational Safety and Health Administration (OSHA)
- Bloodborne Pathogens Standard
- Universal Precautions
- Centers for Disease Control and Prevention (CDC)
- Blood or Other Potentially Infectious Materials (BOPIM)
- Personal Protective Equipment (PPE)

In March of 1992, new regulations from the Occupational Safety and Health Administration went into effect. One aspect of the new regulations is the Bloodborne Pathogens Standard, which is designed to protect workers in health care, as well as other settings. **Bloodborne pathogens** are any disease producing agent that may be transmitted through contact with blood and other body fluids or tissues. In this lesson, you will learn how the new regulations affect the practice of dentistry.

OSHA and CDC

The **Occupational Safety and Health Administration** (OSHA) is a government agency responsible for monitoring the health and safety of employees in America's workplaces. OSHA can penalize employers who do not follow the regulations and guidelines.

The 1991 OSHA regulations incorporated the **Bloodborne Pathogens Standard**, which regulates the work practices of employees who are exposed to **Blood or Other Potentially Infectious Materials** (BOPIM) in the course of performing their job duties.

The **Centers for Disease Control and Prevention** (CDC) is a branch of the U.S. Department of Health and Human Services, Public Health Service. The CDC cannot penalize employees who do not follow CDC recommendations. This agency does research in matters that affect the health of all people and makes suggestions for the prevention of disease.

In 1993, the CDC published its "Recommended Infection Control Practices for Dentistry." Some state legislatures or state dental boards may have adopted these recommended practices as laws or regulations for their particular states, but the CDC does not monitor compliance with its recommendations. That responsibility lies with the individual states that have turned CDC recommendations into state statutes.

Bloodborne Pathogens Standard

All dental offices have a copy of OSHA's Bloodborne Pathogens Standard for workers to review. Therefore, a copy of the Bloodborne Pathogens Standard is not

included in this lesson, but a summary of nine important concepts are addressed.

*** Schedule of Compliance**

A schedule of compliance is a plan, written by an employer and submitted to OSHA, that details the exact dates his/her office will meet all the components of the Bloodborne Pathogen Standard. The dentist will be responsible for being sure all components are covered in the schedule of compliance.

*** Exposure Determination**

The employer must determine and document which job titles and job duties within the office place employees at risk of occupational exposure to BOPIM.

*** Methods of Compliance**

"Methods of Compliance" is a list of specific practices that should be followed in order to protect employees from contact with BOPIM. Practices include:

1. Universal Precautions
2. Engineering and Work Practice Controls
3. Personal Protective Equipment
4. Housekeeping/Laundry
5. Regulated Waste

1. **UNIVERSAL PRECAUTIONS** - are techniques used to protect the Health Care Professional (HCP) from getting an infection from a patient. ALL blood and certain body fluids are treated with the same precautions, as if they all are carriers of Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV), or other bloodborne pathogens. Since saliva in dental procedures is included in this standard, ALL patients, therefore, must be treated as if they are carriers of a bloodborne pathogen.

2. ENGINEERING AND WORK PRACTICE CONTROLS - are specific practices to be used within a dental office to reduce or eliminate incidents of employee exposure. These practices include handwashing, proper disposal of or decontamination of reusable contaminated sharps, careful personal habits, and practices to minimize exposure.

   A. Handwashing - has long been considered the number one method to prevent the spread of infection.

   B. Proper disposal of **contaminated sharps** or disinfection/sterilization of reusable sharps:

   - Needles should not be recapped. If recapping is essential, a one-handed or mechanical procedure should be used to minimize the risk of exposure.
   - Any item which falls into the contaminated sharps definition must be disposed of into an approved sharps container. These

Fig. 3.13 - Sharps Container

containers, labeled with the "Biohazard" emblem, should be located near work stations to limit the need to recap needles. Sharps containers must be leakproof, closable, and puncture resistant.

- A "contaminated reusable sharp" is any instrument or item contaminated with BOPIM and capable of piercing or puncturing the skin that will be re-used in the treatment of patients. Special procedures must be used in disinfecting and sterilizing these items.

C. Careful personal habits

Eating, drinking, and the application of cosmetics, lip balm, or contact lenses must be confined to the employee lounge or the restroom, whichever is appropriate. Hand creams may be applied outside these areas, but employees should be cautioned that many hand creams break down latex gloves making them porous enough for the penetration of BOPIM. Hand creams should not be applied immediately prior to putting on gloves to be used for employee protection.

Coffee or soft drink cups should be confined to the employee lounge area. If they are carried into the operatories or lab, they could possibly be contaminated. Items contaminated with BOPIM must never be allowed within the confines of the employee lounge. Contaminated personal protective equipment must be removed before leaving the lab or operatory. If supplies are refrigerated, they should be refrigerated in an area separate from any food or drink that may be consumed by employees.

D. Practices to minimize exposure

The dental office will develop practices that limit employee exposure to BOPIM as much as possible.

- Employees should never touch their eyes, nose, hair, mouth, or mucous membranes while wearing contaminated gloves.
- The patient's chart or radiographs must never be touched with contaminated gloves. Pens and pencils for charting should not be touched while wearing contaminated gloves unless these implements can be decontaminated.
- If an employee must reach into cabinets or drawers during a procedure, the employee should remove contaminated gloves or over-glove with a clean glove.
- Non-disposable jars and bottles that become contaminated during patient treatment must be decontaminated during clean-up of the operatory.
- High volume evacuation will be used at chairside during procedures that generate BOPIM contaminated aerosols.
- Cleaning and decontamination procedures will be carried out in a manner that limits the production of splashes or splattering of BOPIM.
- If the outside of a biohazard trash bag or sharps container becomes contaminated with BOPIM in the course of disposal, it must be placed within another biohazard bag or leakproof, puncture-resistant container.
- Office equipment that is to be serviced must be decontaminated, or a biohazard emblem must be

affixed to it before it is serviced by repair personnel.
- Tissue specimens that will be shipped to another site, such as biopsy excisions (a thin slice of tissue cut from an area that could be diseased), will be shipped in a leakproof, puncture-resistant container that is clearly marked with the biohazard emblem.

3. **PERSONAL PROTECTIVE EQUIPMENT** (PPE) - The third method of compliance is the provision pertaining to use of personal protective equipment (PPE) by occupationally exposed employees. PPE is any item or garment designed to serve as a barrier against a hazard. In the dental office, PPE serves as a barrier to prevent BOPIM from contacting employees' eyes, skin, mucous membranes, or clothing. Listed below are the types of PPE which will be encountered within the dental office. PPE should never be worn outside the lab or operatory where BOPIM are generated.

   - Lab coats, gowns, or scrub suits that will be worn inside the work area to protect the employee's working clothes or uniform from contamination with BOPIM
   - Filtration masks to be worn by the employee whenever he/she is engaged in job duties that pose the risk of inhalation of BOPIM in an aerosol form, or contact with aerosols or sprays contaminated with BOPIM
   - Impact-resistant safety glasses with solid side shields which the employee will wear whenever aerosols or sprays contaminated with BOPIM may be generated in the course of performing job responsibilities
   - Heavy nitrile or utility gloves to be worn while performing cleaning and decontamination procedures
   - Portable respiration masks designed to protect the employee from exposure to BOPIM while performing artificial respiration or cardiopulmonary resuscitation
   - Latex examination gloves to be worn during all dental procedures and discarded after each patient visit

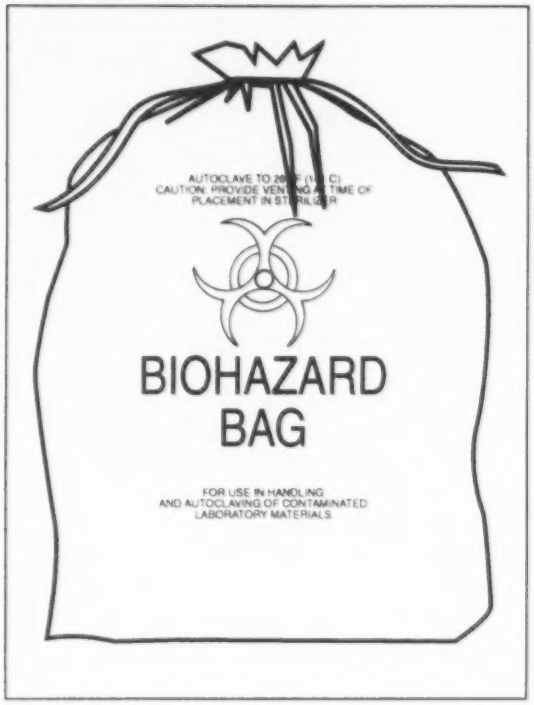
4. HOUSEKEEPING PROCEDURES - OSHA requires that certain procedures be carried out in order to ensure the working environment is as free of contamination from BOPIM as possible. These procedures include techniques for cleaning walls and floors, countertops, instruments, and laundering of reusable PPE

5. REGULATED WASTE - OSHA has determined which items within a health care setting must be treated with special care in order to restrict employee contact with contaminated items that will be thrown out or disposed of. Items considered regulated waste are listed below:

   - Liquid or semi-liquid BOPIM
   - Items contaminated with BOPIM which would release the BOPIM in a liquid or semi-liquid state if the items were compressed
   - Items that are caked with dried BOPIM and are capable of releasing BOPIM during handling
   - Contaminated disposable sharps
   - Pathological or microbiological wastes containing BOPIM

Identified regulated waste must be disposed of in either an approved sharps container or biohazard bag.

Fig. 3.14 - Biohazard Bag



*** Hepatitis B Virus (HBV) Vaccination**

The Bloodborne Pathogens Standard requires that the HBV vaccination series be offered to all occupationally exposed employees within ten working days of the date that the employee begins his/her job. If the employee elects to be vaccinated, the first in the series of three vaccines will be administered only after completion of training on the Bloodborne Pathogens Standard required by OSHA, and within the first ten working days. The employer must provide the vaccination at no cost to the employee. The employee may refuse the vaccination after receiving the proper training and must sign a Hepatitis B declination form. If the employee at a later date decides to accept the vaccination, the employer shall make the Hepatitis B vaccination available at that time.

*** POST-EXPOSURE EVALUATION AND FOLLOW-UP**

In the event that an employee is exposed to a bloodborne pathogen, specific procedures must be followed.

- The first step, and probably most important, is for the employee to immediately report the incident.
- The individual who is the source of the contamination is identified, and with the patient's permission, blood testing for bloodborne pathogens is conducted.
- A detailed incident report is completed.
- The employee is evaluated by the employee's HCP and counseling is initiated if necessary.
- If post-exposure prophylaxis is recommended, the cost of necessary medications is paid by the employer.
- Documentation of the exposure incident must be compiled and retained.

Certain unusual circumstances may cause the post-exposure evaluation and follow-up procedure to be modified.

*** Employee Training**

The Bloodborne Pathogens Standard requires that employers provide specific training to their employees. In addition to specifying the contents of employee training, OSHA requires training be conducted under the following conditions:

- Training must be provided during normal working hours for employees.
- Employees must be provided initial training upon employment but before performing duties that place them at risk for occupational exposure to BOPIM.

- Annual retraining of employees must be provided.
- Employers must provide additional training when modifications in work practices involving occupational exposure occur. For example, if a new piece of equipment for direct patient treatment is purchased, employees must be trained in its safe use and decontamination.

*** Labeling**

OSHA's Bloodborne Pathogens Standard requires that employers label any container that holds substances that are contaminated with BOPIM. Labeling warns employees that the contents of containers are contaminated with BOPIM and employees should take appropriate measures to protect themselves from contact with the contents of labeled containers.

- Labels must include the BIOHAZARD emblem and be fluorescent orange or orange-red with the lettering and or symbols displayed in contrasting color.
- Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing BOPIM, and other containers used to store, transport, or ship BOPIM.
- Contaminated equipment which will be serviced must be labeled so that service personnel may take measures to protect themselves.

*** Recordkeeping**

The OSHA Bloodborne Pathogens Standard requires that employers keep current medical and training records for their employees. Medical records must be maintained for the duration of employment plus thirty years. Training records must be maintained for three years from the date that training occurred.

Fig. 3.15 - Biohazard Symbol

*** Exposure Control Plan**

The OSHA Bloodborne Pathogen Standard requires employers to establish a written plan which details exactly how their particular workplaces will prevent or reduce occupational exposure to BOPIM.

In summary, the OSHA Bloodborne Pathogens Standard applies to all workplaces within the United States in which employees may come into contact with blood or other potentially infectious materials in the course of performing their job duties.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 3: OSHA Bloodborne Pathogens Standard

Activity Sheet

Student Name _____ Date _____

1. What is the main function of OSHA?

2. What are the two (2) main functions of the CDC?

3. List nine (9) components of the Bloodborne Pathogens Standard presented in this lesson.

   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____
   g. _____
   h. _____
   i. _____

4. List five (5) methods of compliance with Bloodborne Pathogens Standard.

   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

5. List six (6) types of personal protective equipment (PPE).

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

Clinical/Laboratory Activities

1. Locate the OSHA Bloodborne Pathogen Standard at your clinical site. After discussing the importance of the standard with the dentist, write a short paper summarizing your findings.

Lesson 4: OSHA Hazard Communication Standard

Objectives:

A. Identify the purpose of the OSHA Hazard Communication Standard.

B. Identify which employees within a workplace fall under the Hazard Communication Standard.

C. Identify characteristics of hazardous chemicals.

D. Identify items which are exempt from the Hazard Communication Standard.

E. Identify the purpose of an MSDS and the information required in each section of an MSDS.

F. Identify the elements which must be included in container labels.

G. Identify how secondary containers must be labeled.

H. Identify employee training requirements.

I. Match the key terms with their definitions or descriptions.

Key Terms:

- OSHA Hazard Communication Standard
- Hazardous Chemicals
- "Right to Know" Law
- Corrosive (kŭ-ˊrō-siv/-ziv)
- Spontaneous (spon-ˊtā-nē-ŭs) Combustion
- Toxic (ˊtok-sik)
- Carcinogenic (kar-sin-ŭ-jen-ik)
- Radioactive (rā˜-dē-ō-āk-tiv)
- Material Safety Data Sheets (MSDS)

Hazard Communication Program

Since 1987, dental offices have been included in **OSHA's Hazard Communication Standard**, which is a set of regulations designed to protect ALL employees in America from potential injury or illness caused by contact with chemicals in the workplace. OSHA (Occupational Safety and Health Administration) is the agency of the federal government that regulates the aspects of employee safety, such as the handling and disposal of potentially hazardous chemicals. **Hazardous chemicals** are products that pose a danger to people or the environment. The OSHA Hazard Communication Standard applies to all employees within the workplace, even those who are part-time or contracted. All employees within a dental office are covered by the Hazard Communication Standard.

The Hazard Communication Standard is known as a **"Right-to-Know" law**. Such a law dictates that employees have a right to know about health hazards in the workplace and how to protect themselves from such hazards.

Each employer must establish a written hazard communication program for his/her workplace and designate one person to coordinate this program. The Hazard Communication Coordinator (HCC) is responsible for all recordkeeping associated with hazard communication as well as ensuring that the workplace stays in compliance with the OSHA Hazard Communication Standard through the

hazard communication program for that office.

The hazard communication program is similar to the exposure control plan required by the OSHA Bloodborne Pathogens Standard in that it is a written document tailored to a specific workplace. Just as the exposure control plan must provide information to employees regarding how they may protect themselves from contact with blood or other potentially infectious materials, the hazard communication program provides information to employees that will help protect them from injury or illness caused by contact with hazardous chemicals.

Hazardous Chemicals

The Environmental Protection Agency (EPA) determines which chemicals may be considered hazardous, but as a rule of thumb, a chemical is considered to be hazardous if it:

- is capable of catching fire without warning (**spontaneous combustion**).
- can react with other substances or chemicals to produce a hazard.
- can explode when mixed with other substances or chemicals.
- is **corrosive** (having a caustic and locally destructive effect on contact with another substance).
- is **toxic** (poisonous).
- is **carcinogenic** (a substance that can cause cancer).
- is **radioactive** (emitting high energy particles that can damage living cells).

Some chemicals are exempt from the Hazard Communications Standard. These include the following:

- any chemical described as a drug by the Food and Drug Administration which is in its solid final form and ready for administration to patients,
- cosmetics intended for personal use by employees,
- consumer products, such as cleansers, which are used in the same way and with the same frequency in the workplace as they would be used in a private home,
- tobacco products,
- wood products, and
- food and alcoholic beverages.

Hazard Communication Standard

In addition to appointing a Hazard Communication Coordinator (HCC), the employer must provide a copy of the *OSHA Hazard Communications Standard* to each employee. Other requirements of the Hazard Communications Program for an office are listed below. Each will be briefly discussed.

- List hazardous chemicals used within the workplace
- Minimize hazards of performing non-routine tasks
- Protect ALL employees equally from hazardous chemicals
- Describe labeling methods
- Collect and maintain Material Safety Data Sheets (MSDS)
- Train employees regarding hazardous chemicals
- Describe how employees are protected from chemicals whose formulas are "trade secrets"

*** List Hazardous Chemicals Used Within the Workplace**

The HCC is not expected to determine on his/her own which chemicals used within the dental office can be considered hazardous. The manufacturers of products are required to label their products regarding the presence of hazardous chemicals. When these products are supplied to workplaces in America, they must be accompanied by a **Material Safety Data Sheet (MSDS)**, which provides even more specific information for employee protection. All products that contain hazardous materials or chemicals must be included on the workplace list, and the HCC must have a MSDS on file for each of those products.

*** Minimize Hazards of Performing Non-Routine Tasks**

Sometimes employees within a workplace are required to perform tasks that are outside their normal routine. Such tasks may include cleaning up spilled chemicals, repairing equipment that could release hazardous chemicals, or using implements for repair that may release hazardous chemicals during use. Special training regarding chemical hazards and safety precautions must be provided to employees before they undertake a non-routine task.

*** Protect ALL Employees Equally From Hazardous Chemicals**

As previously mentioned, the Hazard Communications Standard applies to ALL employees within the workplace, not to just those who perform certain tasks and procedures. While the Bloodborne Communications Standard identifies only "occupationally exposed" employees, the Hazard Communications Standard considers all employees within the workplace. Therefore, the training and provisions of the Hazard Communications Standard apply to all employees. Part-time employees or those who are hired to clean or repair must be provided the same protection as full-time employees.

*** Describe Labeling Methods**

The written hazard communication program for a workplace must identify the person, usually the HCC, who is responsible for seeing that all containers are properly labeled. The program must also describe the labeling system used by that office and how to read the labels so that employees can protect themselves from chemical hazards in dental products. At a minimum, labels must contain the following information:

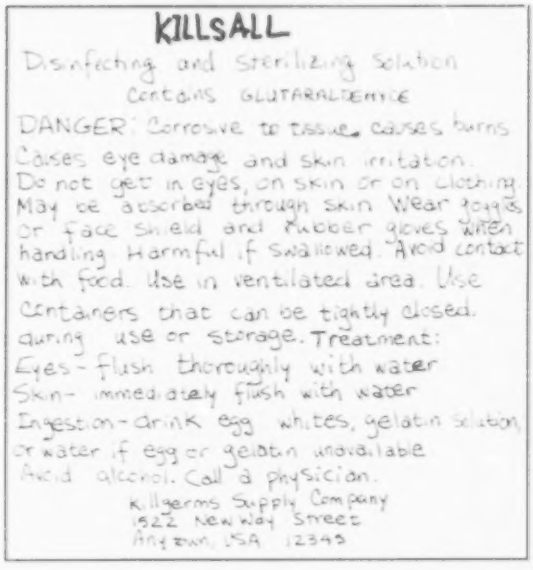
- identity of the chemicals in the product that may pose a health hazard,
- name and address of the chemical's manufacturer or importer, and
- appropriate hazard warnings, such as Flammable, Toxic, etc.

Some products will be placed in a secondary container, such as placing disinfectants bought in bulk into smaller dispensers or spray bottles. The person in charge of labeling must label the secondary containers with the required information. This may be accomplished by making a photocopy of the label from the original container or writing the information on paper and taping it to the secondary container. An example of a handwritten label is in Figure 3.16.

If an employee places a product in a secondary container for his/her immediate use, the container does not require labeling. If other employees will use the product over a period of time, however, it must be labeled.

In dental offices, this labeling stipulation will most often apply to x-ray developer,

Fig. 3.16 - Handwritten Product Label


KILLSALL
Disinfecting and sterilizing Solution
Contains GLUTARALDEHYDE
DANGER! Corrosive to tissue, causes burns
Causes eye damage and skin irritation.
Do not get in eyes, on skin or on clothing.
May be absorbed through skin. Wear goggles
or face shield and rubber gloves when
handling. Harmful if swallowed. Avoid contact
with food. Use in ventilated area. Use
containers that can be tightly closed.
during use or storage. Treatment:
Eyes - flush thoroughly with water
Skin - immediately flush with water
Ingestion - drink egg whites, gelatin solution,
or water if egg or gelatin unavailable.
Avoid alcohol. Call a physician.
Killgerms Supply Company
1522 New Way Street
Anytown, USA 12345

fixer tanks, and sterilization/ disinfection soaks. A photocopy of the original container's label or a handwritten label should be taped to the secondary container.

Color-coded labels are commercially available and easily convey hazard information to employees.

Whatever system a dental office uses, employees must be trained to read and abide by product labels.

Other items that must be labeled are the x-ray units which emit radiation and tanks of flammable or explosive gases.

*** Collect and Maintain Material Safety Data Sheets (MSDS)**

Chemical manufacturers are required to develop MSDS for each chemical they sell. Further, they must provide those MSDS to their distributors or to workplaces if selling directly to the workplace.

Employers are required to obtain an MSDS for each hazardous chemical located within the workplace. They must also maintain those MSDS in an organized fashion so that employees may refer to them at will.

The purpose of an MSDS is to provide highly specific information about a particular hazardous chemical, such as the threat it poses to an employee's health and the treatment for accidental exposure. An MSDS also contains 24-hour phone numbers, information on labeling chemicals, and recommendations for personal protective equipment that should be used when working around specific chemicals.

MSDS that are in compliance with OSHA regulations have eight sections. These eight are listed below. Because the information on MSDS can be very technical and complicated, employers are required to train employees on how to read and use the information provided on MSDS. You may notice when reading an actual MSDS that specific precautions are often repeated in various sections, such as the proper personal protective equipment to use in the presence of hazardous chemicals. This repetition is provided in the interest of safety for product users. See an example of an MSDS in Figure 3.17.

1. Manufacture Information
2. Hazardous Ingredients/Identity Information
3. Physical/Chemical Characteristics
4. Fire and Explosion Hazard Data
5. Reactivity Data
6. Health Hazard Data
7. Precautions for Safe Handling and Use
8. Control Measures

*** Train Employees Regarding Hazardous Chemicals**

Employers must provide initial training regarding possible hazards new employees may encounter while performing their job duties. Employees must also be trained

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Fig. 3.17 - Material Safety Data Sheet (MSDS)

(Front)

MATERIAL SAFETY DATA SHEET

1.1 Product Trade Name: IRM® POWDER
1.2 Part (Item) Number: 610003

SECTION I

1.3 Division Name	Caulk/Dentsply
1.4 Address	Clarke and Lakeview Aves. Milford DE 19963-0359
1.5 Emergency phone number	(302) 422-4511
1.6 Phone number for information	(302) 422-4511
1.7 Date prepared	January 12, 1990

SECTION II - Hazardous Ingredients/Identify Information

Hazardous Components	OSHA PEL	ACGIH TLV	Other limits
Zinc Oxide	5 mg/m³ - 10 mg/m		

SECTION III - Physical/Chemical Characteristics

3.1 Boiling point	N.A.	**3.6 Specific Gravity**	5.7 g/cm³
3.2 Vapor pressure	N.A.	**3.7 Melting point**	N.A.
3.3 Vapor density	N.A.	**3.8 Evaporation rate**	N.A.
3.4 Solubility in water	Not Soluble		

3.5 Appearance and odor: Whitish powder with faint odor.

SECTION IV - Fire and Explosion Hazard Data

4.1 Flush point (method used) N.A.
4.2 Flammability (explosive limits)
LEL: N.A. **UEL:** N.A.
4.3 Extinguishing media : Water, carbon dioxide, dry chemical, halon - for the polymer.
4.4 Special fire fighting procedures : Avoid extinguishing methods which may generate dust clouds. Water stream can disperse dust in air producing a fire hazard and possible explosion hazard if exposed to ignition source.
4.5 Unusual fire and explosion hazards: Polymer dust is combustible. The explosive limits of the polymer particles suspended in air are approximately those of coal dust. Fire Fighters should wear self-contained breathing apparatus.

SECTION V - Reactivity Data

5.1 Stability: **Unstable:** **Stable:** X
5.2 Conditions to avoid (stability): Heat above 300°C.
5.3 Incompatibility (materials to avoid): Strong oxidizing agents.
5.4 Hazardous decomposition or byproducts: Oxides of zinc. From the polymer - methylmethacrylate and carbon monoxide.
5.5 Hazardous polymerization **May occur:** **Will not occur:** X
5.6 Conditions to avoid (polymerization) Heat above 300°C.

SECTION VI - Health Hazard Data (Back)

6.1 Route(s) of entry: **Inhalation?:** Yes **Skin?:** No **Ingestion?:** Possible
6.2 Health hazards (acute and chronic): It is not known to cause significant health problems. It is considered an inert or nuisance dust. Avoid inhalation of dust. Keep dust out of eyes to prevent possible irritation. May dry the skin causing irritation.
6.3 Carcinogenicity NTP?: Not listed **IARC monographs?:** Not listed
OSHA regulated?: NO
6.4 Signs and symptoms of exposure: Irritation of eyes or skin.
6.5 Medical conditions generally aggravated by exposure: Open sores or wounds of the skin.
6.6 Emergency first aid procedures: INHALATION: Remove to fresh air. Get medical help if discomfort persists. EYES: Flush with water for 15 minutes, including under eyelids. SKIN: Wash with soap and water. Ingestion: Rinse mouth with water. Call doctor if amount was large.

SECTION VII - Precautions for safe handling and use

7.1 Steps to be taken in case material is released or spilled: As with any nuisance dust, avoid excessive dusting. Sweep up to avoid slipping hazard. Keep airborne particulate at a minimum when cleaning up spills.
7.2 Waste disposal methods: Dispose of in accordance with all applicable Local, State and Federal Regulations.
7.3 Precautions to be taken in handling and storage: Store in a cool dry place. Keep container closed to prevent water absorption and contamination.
7.4 Other precautions: Observe normal warehousing procedures. Store away from foodstuffs and beverages.

SECTION VIII - Control Measures

8.1 Respiratory protection	: U.S. Bureau of Mines Approved Respirator
8.2 Ventilation	: Local exhaust Recommended
8.3 Protective Gloves	: Rubber Gloves
8.4 Eye protection	: Safety Glasses
8.5 Other protective clothing or equipment:	Rubber Apron
8.6 Work/Hygienic practices	Observe normal care when working with chemicals

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Courtesy of Caulk/Dentsply, Milford Delaware

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before performing duties that would place them in contact with potentially hazardous chemicals.

The Hazard Communication Standard also requires additional training any time new hazards are introduced into the workplace.

ALL employees must be trained regarding ALL chemical hazards present within the workplace, even if some employees are never expected to work with or contact a hazardous chemical in the course of their jobs. In a dental office, this stipulation would mean that the receptionist and/or office help would receive the same training as the dental hygienist, assistant, and aide.

In order to ensure that employees maintain knowledge and skills regarding hazardous chemicals, annual re-training is required by the Hazard Communication Standard. These re-training sessions must meet the same criteria a. initial training, even though employees have been offered the information before.

The requirements for initial and annual training are listed below:

- Inform employees of the Hazard Communications Standard, providing each employee with a copy of the standard;
- Describe all work practices that involve the use of hazardous chemicals and define all areas of the workplace that house hazardous chemicals;
- Inform employees where they may gain access to the written hazard communication program, the list of hazardous chemicals, and the file containing MSDS, as well as the identity of HCC;
- Train employees to detect the presence of hazards;
- Explain physical and health hazards posed by the specific chemicals used in each workplace;
- Provide personal protective equipment;
- Provide site-specific information; and
- Detect the presence of hazards.

Employees must be trained to determine when chemicals within a product pose a danger. Monitoring devices may be worn by employees (usually as lapel pins) to see if they are being exposed to acceptable levels of hazards. The common name for these devices is "dosimeter." Dosimeters contain materials which physically (chemically) change when exposed to certain chemicals or radiation. These devices are regularly sent to labs to determine the amount of exposure to the employee.

*** Describe How Employees Are Protected From Chemicals Whose Formulas Are "Trade Secrets"**

Some product manufacturers claim that to reveal certain chemicals contained in their products would, in effect, be revealing "secret formulas" to their competitors. For this reason, OSHA does not require that "trade secret" chemicals be identified on MSDS as long as information and safety precautions for the nameless chemicals' potentially hazardous effects are included in the MSDS. Essentially, the only information the manufacturer may omit from the MSDS is the specific name of a "trade secret" chemical.

For emergency treatment or first-aid after exposure to a trade secret chemical, the manufacturer is required by law to immediately identify secret chemicals to exposed employees and to their health care professionals. If an exposure occurs but is not considered an emergency by the attending HCP, the HCP may request the

identity of the secret chemical in writing from the manufacturer.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written unit evaluation. A score of 80 percent indicates you have mastered this material. Check with your clinical supervising staff member for skill testing.

Lesson 4: OSHA Hazard Communication Standard

Activity Sheet

Student Name _____ Date _____

Place a "T" in front of statements that are true and an "F" in front of statements that are false. If you mark a statement "false," explain the correct answer on the lines provided.

1. _____ The Hazard Communication Standard only applies to employees who are exposed to hazardous chemicals in the course of performing job duties.

_____

_____

2. _____ Chemicals that cause cancer are called carcinogenic.

_____

_____

3. _____ A chemical is taken from its original labeled container and placed in a secondary container. It the chemical is to be used right away by the employee who transferred the chemical, the secondary container does not require a label.

_____

_____

4. _____ A dosimeter device monitors an employee's contact with hazards such as radiation or chemical.

_____

_____

List three ways an employee may determine whether a product contains a hazardous chemical.

5. _____ 6. _____ 7. _____

Clinical/Laboratory Activities

1. At your clinical site, ask to see where the MSDS are located.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Infection Control Rating _____

Comments: _____

_____

_____

Skill Sheet #1: Wash Hands Rating _____

Skill Sheet #2: Don and Remove Mask Rating _____

Skill Sheet #3: Don and Remove Nonsterile Gloves Rating _____

Skill Sheet #4: Don and Remove Gown Rating _____

Activity Sheet #2: Instrument Preparation, Disinfection, and Sterilization Rating _____

Comments: _____

_____

_____

Skill Sheet #5: Bag Instruments Rating _____

Skill Sheet #6: Wrap Instruments Rating _____

Skill Sheet #7: Decontaminate Operatory Rating _____

Activity Sheet #3: OSHA Bloodborne Pathogens Standard Rating _____

Comments: _____

_____

_____

Activity Sheet #4: OSHA Hazard Communication Standard Rating _____

Comments: _____

_____

_____

Written Unit Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit IV

Basic Anatomy of the Oral Cavity

It is very important for the dental aide to recognize the basic landmarks and the types of teeth within the oral cavity. In this unit you will learn the names and types of teeth as well as some of the other structures associated with the oral cavity. You will also learn about the two most common diseases of the teeth and oral tissues, and how these diseases may be prevented. The lessons contained in this unit are listed below.

Unit Lessons

Arches, Planes, and Quadrants

Names, Types, and Functions of Teeth

Primary Dentition

Surfaces of Teeth

Notation Systems

Anatomical Parts and Tissues of Teeth

Factors Influencing Dental Health

Lesson 1:
Arches, Planes, and Quadrants

Objectives:

A. Identify the dental arches.

B. Identify the midline and the occlusal planes on a diagram.

C. Identify the quadrants of the oral cavity on a diagram.

D. Identify the right and left sides of a patient's oral cavity based on a dental chart or diagram.

E. Identify key terms and their definitions.

Key Terms:

- Dentition (dĕn tĭsh´ ūn)
- Arch (´ō rch)
- Maxillary (măk˝ sĭl lĕr´ rē) Arch
- Mandibular (măn dĭb´ ū lahr) Arch
- Mandible (măn dĭ bĭl)
- Mastication (mas tū´ kā shūn)
- Midline (´mid´ līn)
- Occlusal (ū ´kloo sūl) Plane
- Quadrant (´kwŏd rŭnt)

In dentistry, the oral cavity is divided into sections in order to make identification of teeth and other structures as simple as possible. Lesson one of this unit will familiarize you with the sections of the oral cavity as well as where these sections begin and end and how they are named.

Arches

The oral cavity, which is how the mouth is referred to in dentistry, is a complex region of the human body composed of many parts. The oral cavity has the same types of teeth on the right side of the mouth as on the left. An adult who has complete **dentition** (set of teeth) will have 32 separate teeth.

An **arch** is the entire upper or entire lower half of the dentition. The upper half of the oral cavity is referred to as the **maxillary arch**. The bone forming this arch is the maxilla.

Fig. 4.1 - Arches

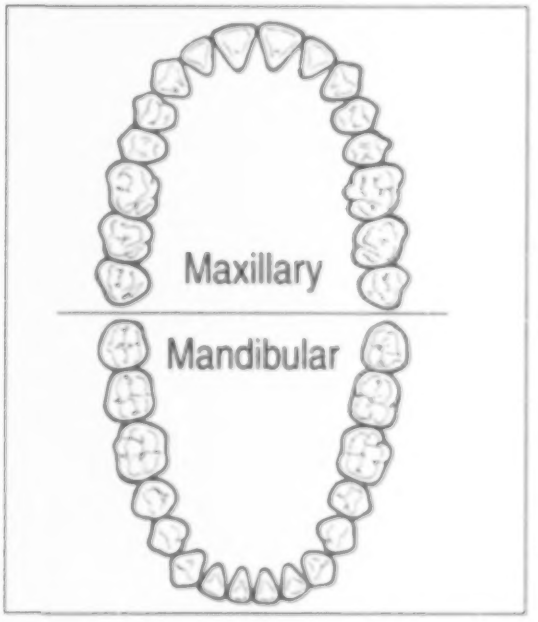
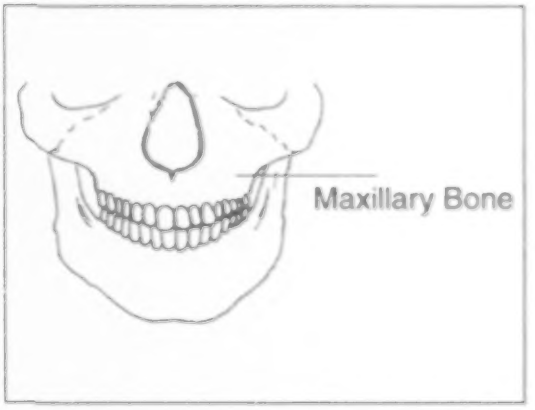


Fig. 4.2 - Maxillary Bone



The lower half of the oral cavity is known as the **mandibular arch**. The bone forming this arch is the **mandible**, which is often referred to as the "jaw." The mandible is the only bone in the human skull that is freely movable. The ability to move the mandible allows people to open and close the mouth. This process is referred to as chewing or **mastication**.

Fig. 4.3 - Mandibular Bone

When referring to teeth, it must be specified whether the teeth are maxillary or mandibular. This is the first step in identification of the teeth.

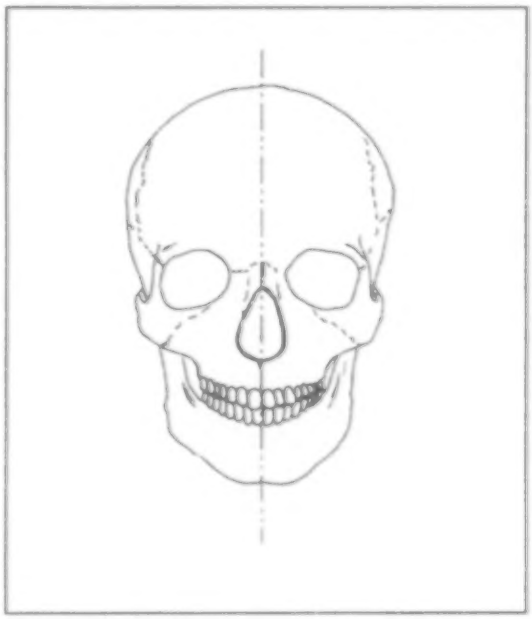
The maxillary and mandibular arches each contain the same number and type of teeth.

Planes

In addition to the stipulation of upper or lower (maxillary or mandibular), you must also state to which side of the oral cavity (right or left side of the mouth) you are referring.

The oral cavity is divided into right and left halves by an imaginary line or plane. In dentistry, this line is referred to as the **midline** and is located between the two front teeth (central incisors). All teeth located to the right of a patient's midline on the maxillary arch are called the maxillary right teeth. Those to the left of the midline are the maxillary left teeth. The teeth located to the right of the midline on the mandibular arch are the mandibular right teeth, and those to the left of the midline are the mandibular left teeth.

Fig. 4.4 - Midline

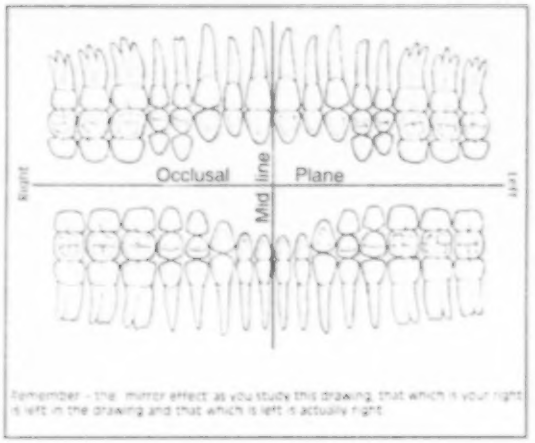


Each arch contains the same number and type of teeth on both the right and left sides.

Dental charts are used to record conditions needing treatment or conditions that have been treated on the patient. The right side of the chart is actually the patient's left side. If a notation is made on a tooth on the right side of the chart, the actual tooth is on the patient's left side. This concept is

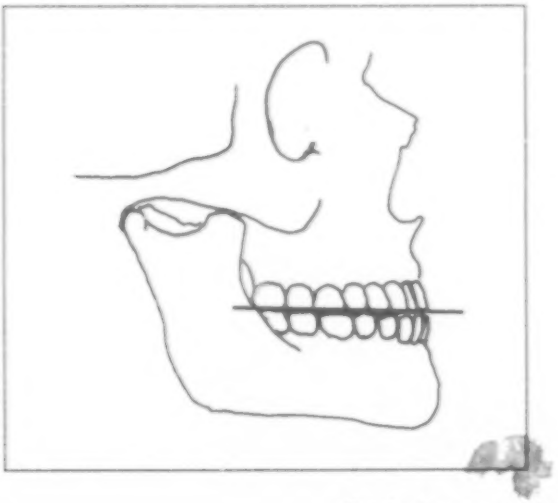
confusing at first, but it MUST be mastered by the dental aide.

Fig. 4.5 - Dental Chart



Another imaginary line is located horizontally between the maxillary and mandibular arches. This line divides the oral cavity into upper and lower halves. In dentistry, this transverse plane line is most often referred to as the **occlusal plane**. It is called this because the key biting surfaces of back teeth are called occlusal surfaces and the occlusal plane is located between the occlusal (biting) surfaces of maxillary and mandibular teeth.

Fig. 4.6 - Occlusal Plane

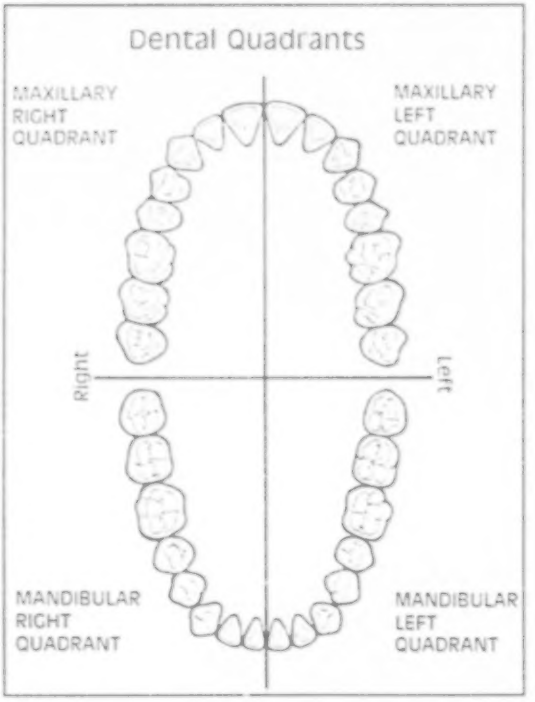


Quadrants

The intersection of the midline and the occlusal plane results in the division of the oral cavity into four separate quadrants. Each **quadrant** represents one fourth of the total dentition. Quadrants contain the same number and type of teeth.

A tooth is first identified by the arch in which it is located (maxillary or mandibular), then by whether it is located to the right or left of the midline, and then by its proper name (e.g., maxillary right first premolar.

Fig. 4.7 - Quadrants



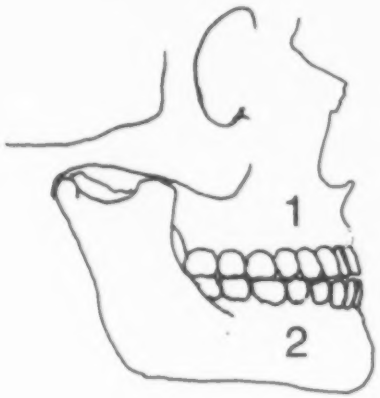
Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

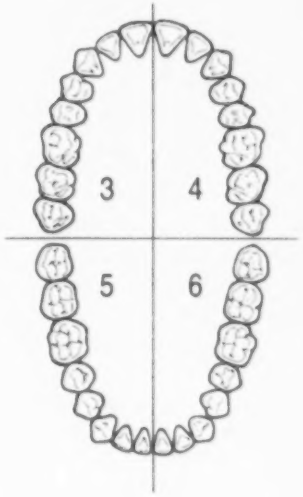
Lesson 1: Arches, Planes, and Quadrants

Activity Sheet

Student Name _____ Date _____

Name the numbered structures in the spaces provided.





Name the arches.

1._____

2._____

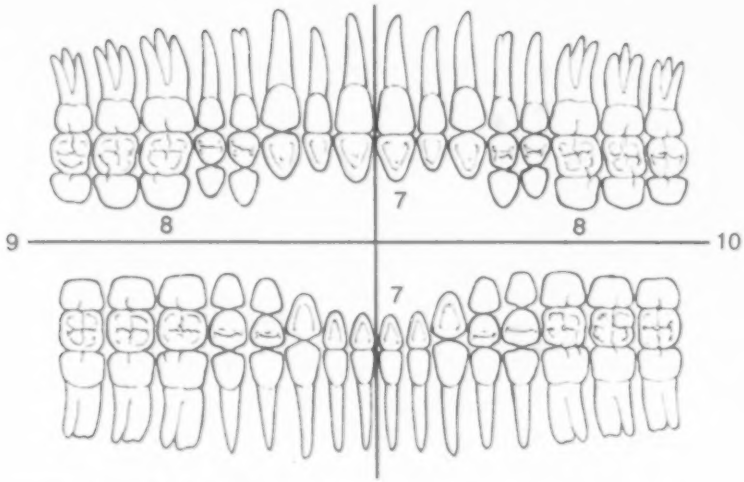
Name the quadrants.

3._____

4._____

5._____

6._____



Name the planes.

7._____

8._____

9. Which side of the patient's oral cavity does this represent? _____

10. Which side of the patient's oral cavity does this represent? _____

Clinical/Laboratory Activities

1. Discuss with dental staff members why it is so important to understand basic anatomy of the oral cavity.

Lesson 2:
Names, Types, and Functions of Teeth

Objectives:

A. Name all of the anterior and posterior teeth.

B. Identify the functions of each type of tooth.

C. Identify how many roots each tooth has.

D. Distinguish between maxillary and mandibular molars on a diagram.

E. Differentiate maxillary first premolars from other premolars.

F. Identify the teeth on linear and anatomical charts.

G. Identify teeth according to quadrant and proper name.

H. Identify key terms and their definitions.

Key Terms:

- Anterior (an ´tir rē ŭr)
- Incisors (īn sī´ zor)
- Central (´sen trŭl) Incisors
- Lateral (´lat ŭ rŭl) Incisors
- Distal (´dis tŭl)
- Cuspids (kŭs pŭd) or Canines (kā´ nīn)
- Root
- Posterior (pō ´stir ē ŭr)
- Premolars (´prē mō lŭr)
- Molars (mō lŭr)
- Impacted (im ´pak tŭd)

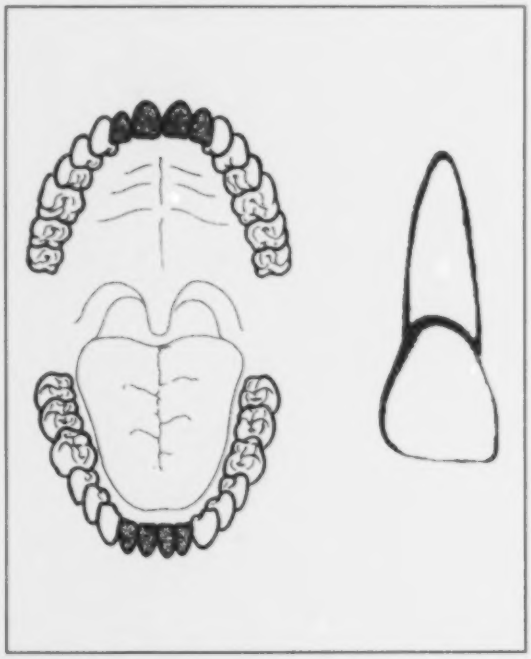
This lesson will build on the information presented in lesson one. Each arch and quadrant of the dentition contains a specific number of teeth with specific functions in speech and mastication (chewing). In lesson two, you will learn the names of these teeth, where they fit in the dental arches, and their functions.

Anterior Teeth

Complete adult dentition consists of a total of 32 teeth, or 16 teeth in each dental arch. There are four basic types of teeth, each with a specific function: incisors, canines, premolars, and molars.

The incisors are part of a group of teeth known as **anterior** teeth. The term "anterior" means "toward the front." **Incisors** are located toward the front of the oral cavity. The function of incisors is to cut, or "incise," food so it can be safely and comfortably swallowed. People obviously cannot chew and swallow an

Fig. 4.8 - Incisors



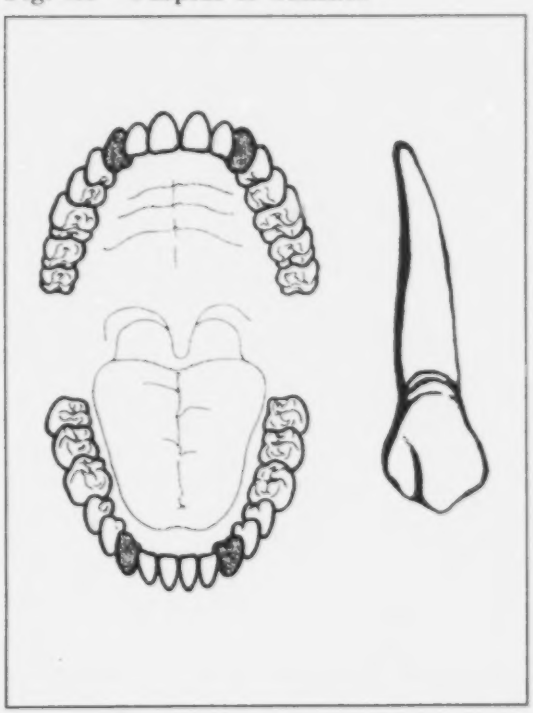
entire sandwich in one bite, so the incisors cut off pieces of the sandwich that are small enough to chew. Incisors, as well as most of the other teeth, also play a role in forming clear speech sounds.

There are two groups of incisors. The **central incisors** are the two front teeth closest to the midline in each arch. The midline is located between the central incisors.

Lateral incisors are the teeth immediately **distal** (situated away from the midline following the curve of the dental jaw) to the central incisors in each quadrant. The term "lateral" means "next to" or "to the side." The lateral incisors are next to the central incisors.

The third teeth distal to the midline in each quadrant are the cuspids or canines. It is acceptable to use either of these terms. These teeth are also considered part of the group known as anterior teeth. The

Fig. 4.9 - Cuspids or Canines



cuspids or **canines** usually resemble "fangs" in the respect that they are pointy compared to the incisors. The function of canines is to tear food. There is one canine distal to the lateral incisor in each quadrant.

The canines and incisors constitute the anterior teeth. There are three anterior teeth in each quadrant, and six in each arch.

Straight white front teeth are considered aesthetically (dealing with beauty) pleasing in our culture. Missing front teeth are not considered aesthetic at all.

All anterior teeth have one root. The **root** or roots of teeth are the parts of the teeth that are under the gumline.

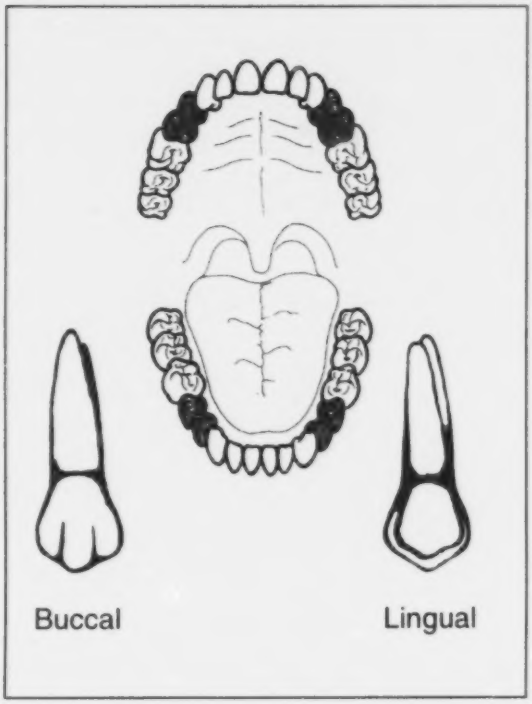
Posterior Teeth

Premolars are part of a group of teeth known as posterior teeth. The term "**posterior**" means "toward the back." Premolars and molars are located in the back of the mouth. **Premolars** assist the canines in tearing food into pieces and the molars in grinding and pulverizing food into a size and consistency suitable for swallowing.

The fourth and fifth teeth distal to the midline in each quadrant are the first and second premolars, respectively. Some people call these teeth the first and second "bicuspids," but the accepted names for them are premolars. The first and second premolars lie directly behind the canine in each quadrant. The tooth immediately distal to the canine is the first premolar, and the tooth behind, or distal to, the first premolar is the second premolar.

All premolars, except the maxillary first premolars, have one root. Maxillary first premolars have two roots.

Fig. 4.10 - Premolars



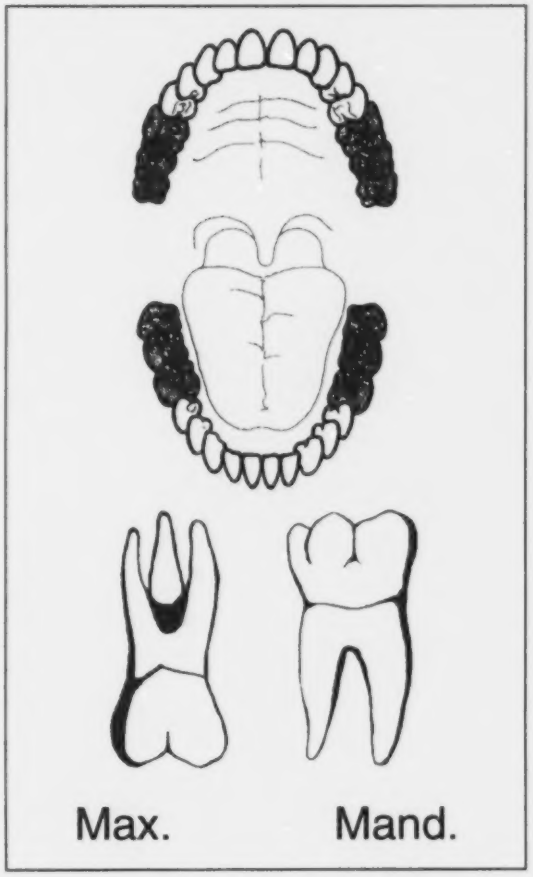
The last three teeth in each quadrant are the **molars**. There are normally three molars located immediately distal to the second premolars in complete dentition. The molars are named as first molars, the teeth first in line behind the premolars; second molars, which are located distal to the first molars; and third molars, which may be the very last teeth in each quadrant.

Some people refer to the first molars as the "six-year molars," the second molars as the "twelve-year molars," and the third molars as the "wisdom teeth." These names are not accepted as the proper dental terms for these teeth, but instead describe the age in which they appear in the mouth.

The function of molars is to grind food into a size and consistency that is safe and comfortable to swallow. Maxillary molars have three roots, and mandibular molars have two roots.

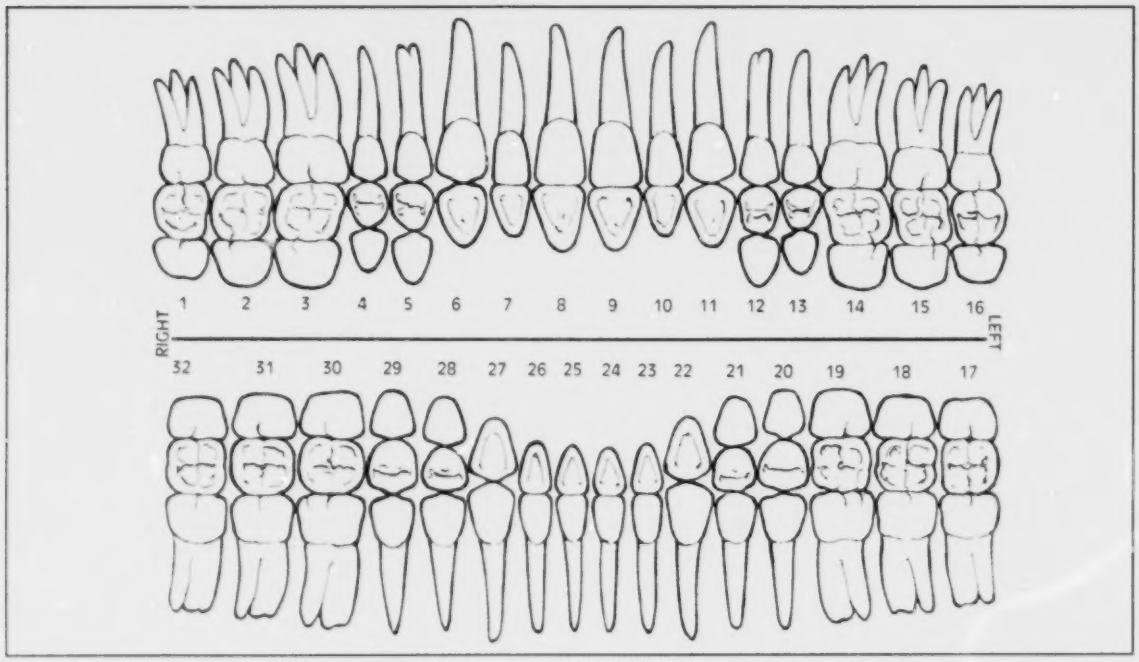
You may observe many patients whose third molars never formed at all. Third molars are also commonly impacted. An **impacted** tooth is one that has no room to erupt into the dental arch.

Fig. 4.11 - Molars



The premolars and molars constitute the posterior teeth. There are five posterior teeth in each quadrant and ten in each arch.

Fig. 4.12 - Linear Anatomical Dental Chart



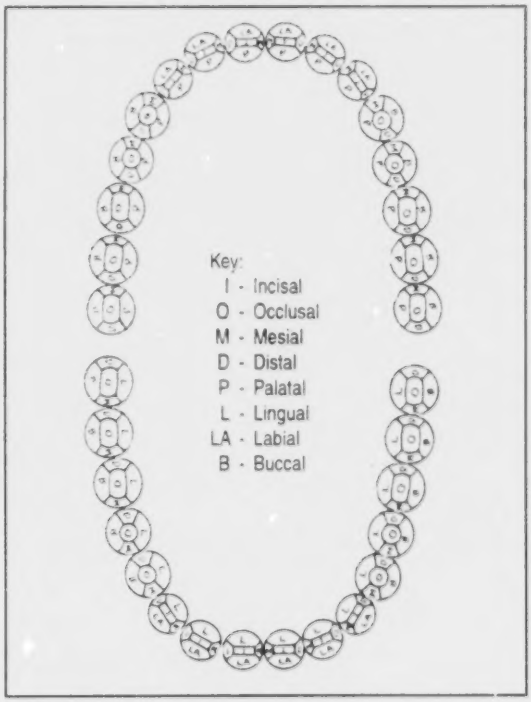
Dental Charts

Dental charts are used to record conditions that require treatment. They illustrate the teeth within the dental arches in several ways: linear anatomical chart, circular anatomical chart, linear geometric chart, and circular geometric chart. In linear dental charts, the teeth are pictured in a straight line across each arch. Circular charts illustrate the arches in their natural curved position, as if the patient's mouth were wide open.

An anatomical chart presents the actual anatomy of the teeth. A geometric chart divides the teeth into five distinct areas.

The dental aide should be able to identify all of the teeth on linear or geometric charts. Remember that the right side of the dental chart represents the left side of the patient's mouth and vice versa. This is sometimes referred to as the "mirror effect."

Fig. 4.13 - Circular Geometric Dental Chart



In order to avoid confusion, the correct way to identify teeth is by arch, side, and proper name. An example of correct identification is mandibular left first molar.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 2: Names, Types, and Functions of Teeth

Activity Sheet

Student Name _____ Date _____

Follow directions for identification of the numbered structures:

1.

2.

3.

1. In which arch does this premolar belong?_____ Is it a first or second premolar?_____ Explain how you arrived at your answer.

_____

_____

2. In which arch does this molar belong?_____ Explain how you arrived at your answer.

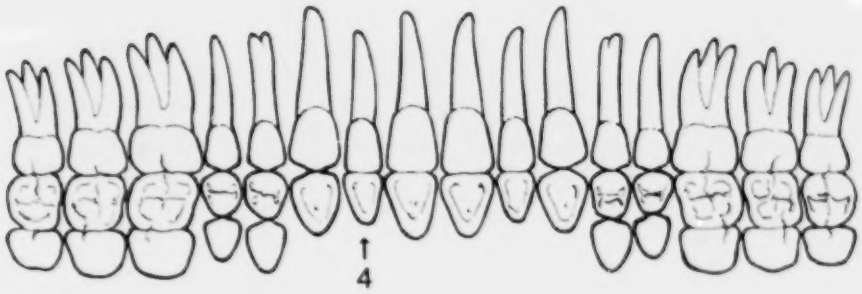
_____

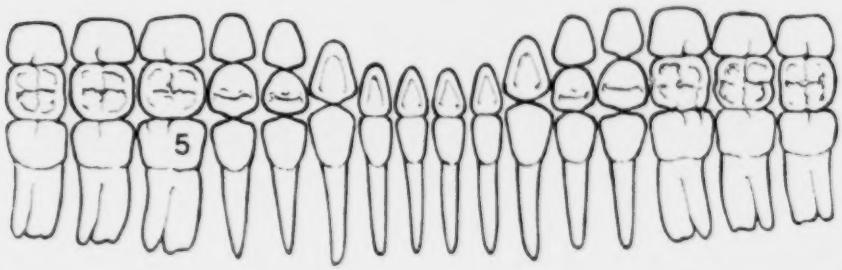
_____

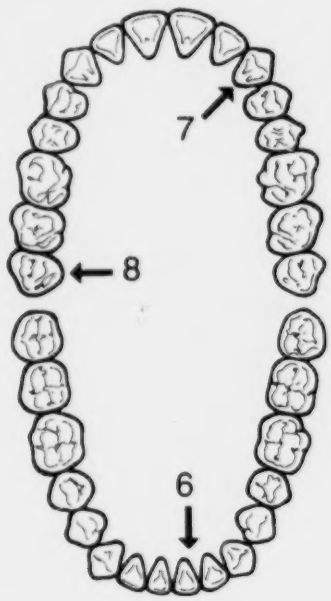
3. In which arch does this molar belong?_____ Explain how you arrived at your answer.

_____

_____







Name the numbered teeth:

4._____

5._____

6._____

7._____

8._____

Clinical/Laboratory Activities

1. What types of dental charts are used at your clinical site?

_____

_____

Lesson 3: Primary Dentition

Objectives:

A. Identify permanent and primary teeth on a diagram.

B. Identify the deciduous teeth on a dental chart.

C. Define mixed dentition.

D. Identify key terms and their definitions.

Key Terms:

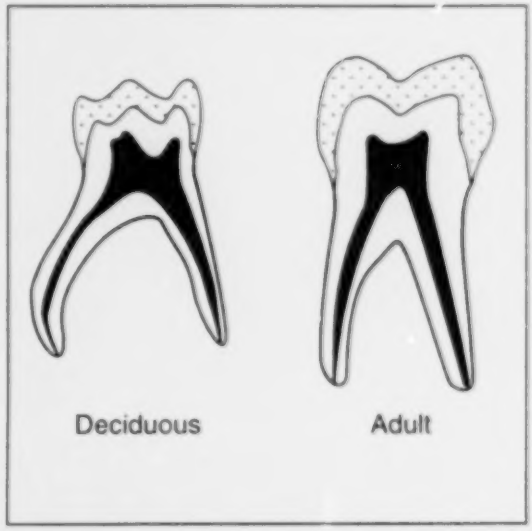
- Deciduous (dē sīd´ ū ūs) Teeth
- Primary Teeth
- Permanent Teeth
- Exfoliation (ĕks fo˝ le ā´ shŭn)
- Resorption (rē sorp´ shŭn)
- Space Maintainer
- Mixed Dentition

Although there are many similarities between adult and child dentitions, there are certain characteristics that are unique to the child, or primary, dentition. This lesson will familiarize you with the similarities and differences between permanent and primary teeth.

Deciduous Dentition

Humans obtain two sets of teeth within a lifetime. The **deciduous teeth** begin erupting around the age of six to eight months and erupt until the age of two or three years. These teeth are not meant to last a lifetime, but are small enough and sufficient in number for the size of a child's maxilla and mandible. Children begin losing their deciduous teeth around the age of six, when the arches are almost large enough to accommodate adult teeth. In fact, the term "deciduous" means to "shed," which is exactly what happens to the deciduous dentition. Another acceptable name for the deciduous dentition is the "primary" dentition. "Primary" means "first in a series," and the **primary teeth** are the first teeth to erupt.

Fig. 4.14 - Comparison of Adult and Deciduous Teeth



Deciduous teeth resemble permanent teeth in that they have the same number of roots as their permanent counterparts. However, deciduous teeth are smaller and appear somewhat "squat" compared to permanent teeth.

Another significant difference between the two sets of dentition is that there are thirty-two permanent teeth and only twenty deciduous teeth. This is because the primary dentition does not have any premolars or third molars.

Perhaps the most significant difference between primary and **permanent teeth** is that primary teeth are designed to be shed, and permanent teeth are not. In dentistry, the shedding of primary teeth is referred to as **exfoliation**. The roots of the primary tooth begin to dissolve and are **resorbed**

(absorbed) by the body. Without roots to anchor a deciduous tooth within the bone, the deciduous tooth loosens and falls out. It is important that primary teeth not be lost prior to their natural shedding dates because the teeth in front and back of the lost tooth may drift to fill the space. When deciduous teeth drift, there may not be enough room for the permanent tooth to erupt, causing the permanent tooth to become impacted. It is important to take good care of the deciduous dentition so that these teeth will not be lost before their natural shedding dates.

Fig. 4.15 - Adult Dentition

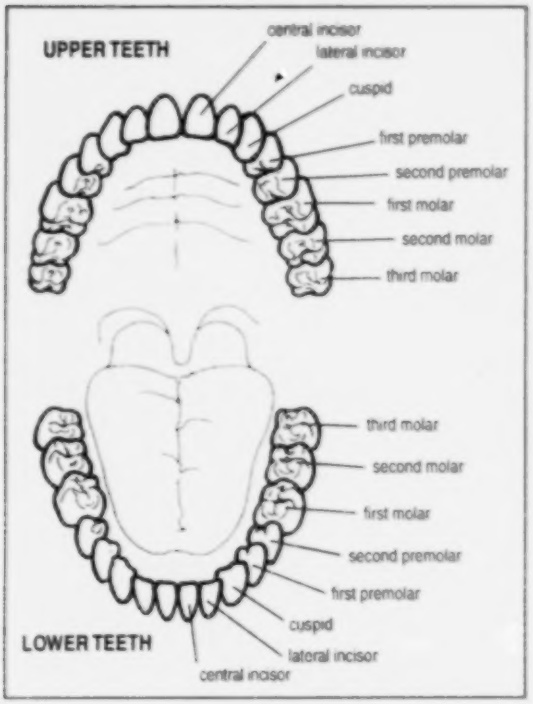


Fig. 4.16 - Child Dentition

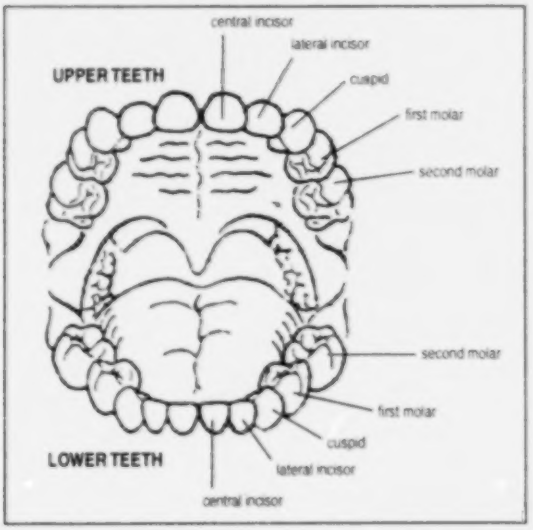
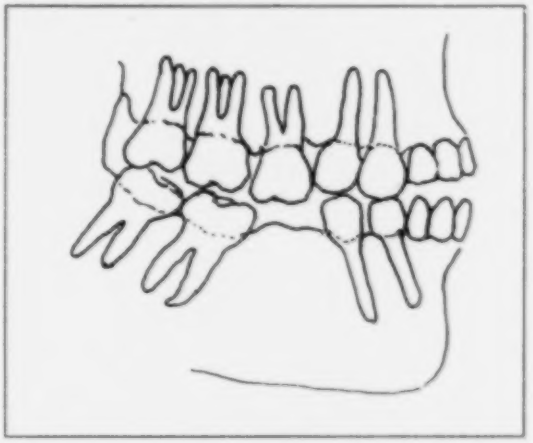
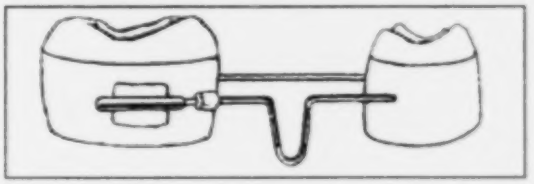


Fig. 4.17 - Tooth Spacing



If a deciduous molar is lost prematurely, the dentist may decide to place a **space maintainer** in the area where the primary tooth was lost. These devices physically prevent the teeth in front and back of the space from drifting into the vacant space.

Fig. 4.18 - Space Maintainer

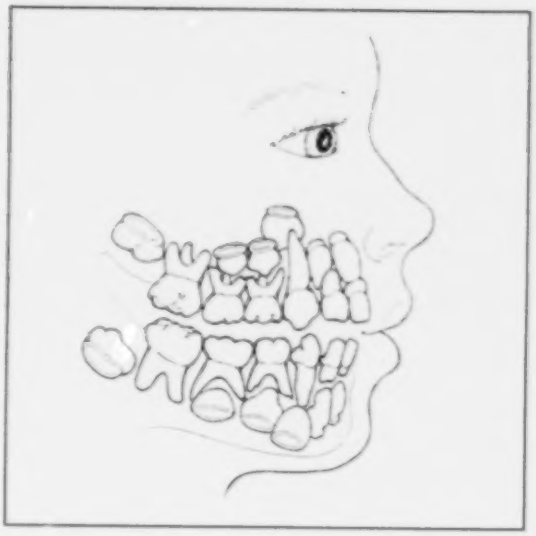


Between the ages of six and twelve, children will have a collection of various permanent and primary teeth in each arch. This time is known as the period of **mixed dentition**. Permanent central and lateral incisors replace deciduous central and lateral incisors. Permanent cuspids replace deciduous cuspids. Permanent first premolars replace deciduous first

molars. Permanent second premolars replace deciduous second molars. Permanent molars do not replace any deciduous teeth; they erupt posterior to the deciduous dentition. Deciduous dentition does not have premolars. Figure 4.19 shows an example of mixed dentition.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

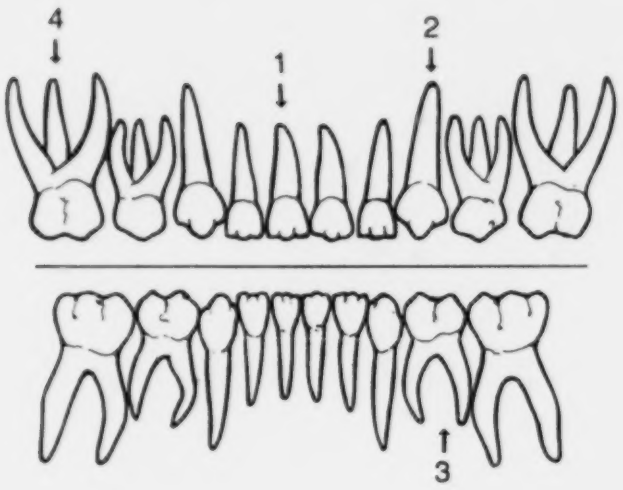
Fig. 4.19 Mixed Dentition

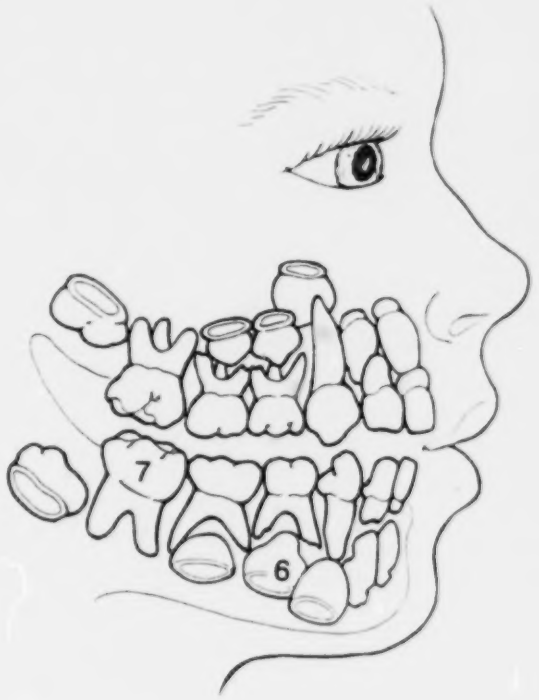


Lesson 3: Primary Dentition

Activity Sheet

Student Name _____ Date _____





Identify the numbered teeth as indicated.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Clinical/Laboratory Activities

1. At your clinical site, ask to see examples of charts or radiographs showing primary dentition.

Lesson 4: Surfaces of Teeth

Objectives:

A. Identify the different surfaces of the teeth.

B. Identify each tooth and its surfaces on a geometric and an anatomical chart.

C. Identify key terms and their definitions.

Key Terms:

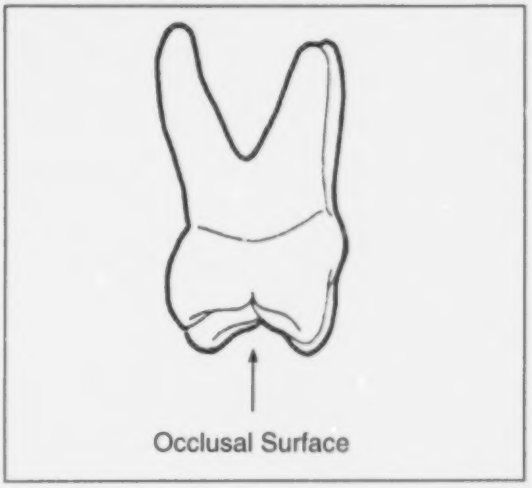
- Occlusal (ŭ ´kloo zŭl) Surfaces
- Incisal (ĭn sī zăl) Edge
- Interproximal (int ŭr˝ prok sŭ mŭl) Surface
- Mesial (mē´ zē ăl) Surface
- Distal (dis tŭl) Surface
- Facial (fā shŭl) Surface
- Labial (lā´ bē-ăl) Surface
- Buccal (bŭk´ ŭl) Surface
- Lingual (lĭng´ gwahl) Surface
- Palatal (pal´ at) Surface

When a tooth decays or requires dental treatment, it is most often only one small area of the tooth that needs attention. In order to avoid confusion over which area of a tooth may require treatment, teeth are divided into five distinct surfaces. This lesson will cover the five surfaces of teeth and how to recognize each of them.

Biting Surfaces

The biting or chewing surfaces of posterior teeth are called the **occlusal surfaces**. You will remember from previous lessons that the posterior teeth are those located toward the back of the arch: the premolars and molars.

Fig. 4.20 Occlusal Surface



The cutting edges of anterior teeth are called the **incisal edges**. You will remember that anterior teeth are those teeth located toward the front of the dental arch: the central and lateral incisors and the canines, or cuspids. The function of most of the anterior teeth is to cut or "incise" food into manageable sizes for mastication, hence the name "incisal edge."

Fig. 4.21 Incisal Edge

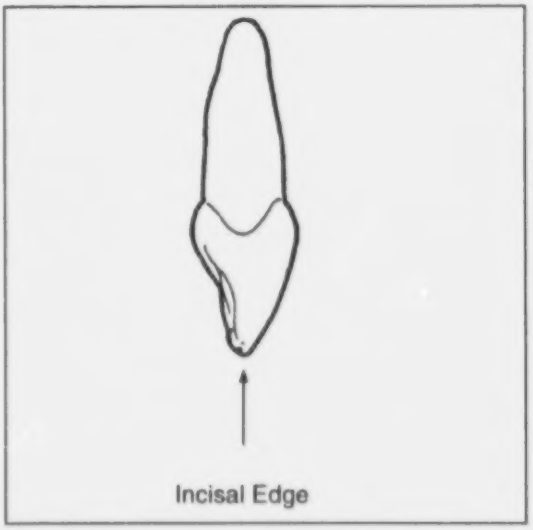
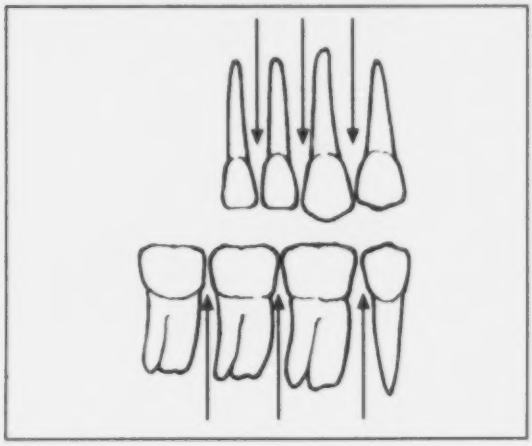


Fig. 4.22 Interproximal Surfaces

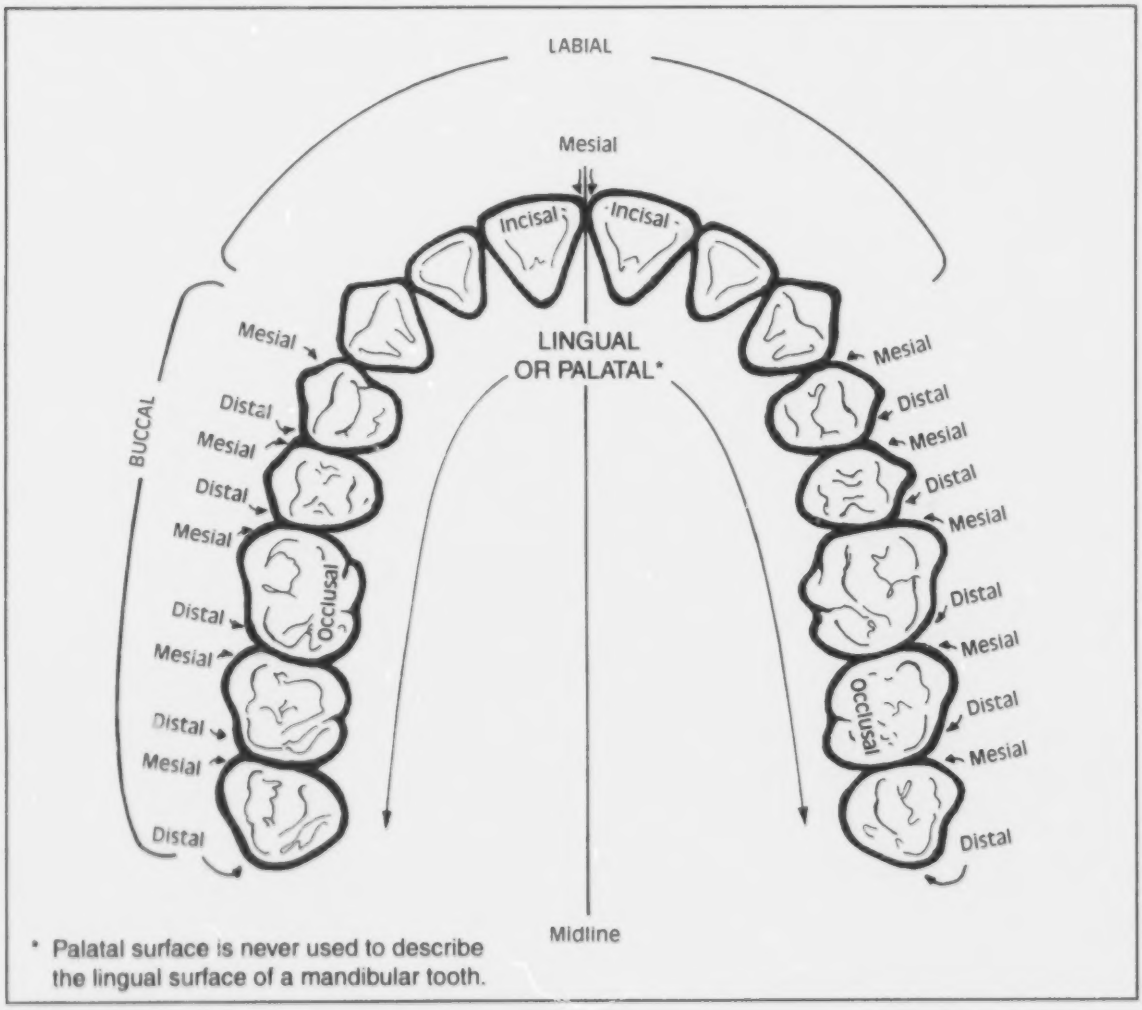


Interproximal Surfaces

Each tooth has a side that faces toward the midline of the oral cavity and a side that faces away from the midline of the oral cavity. These surfaces are called the **interproximal surfaces** because the term "proximal" means "adjacent to or next to." The interproximal surfaces of one tooth will lie next to the interproximal surfaces of the next tooth.

The side of a tooth that faces the midline of the oral cavity is the **mesial surface**. You will recall that the midline is the

Fig. 4.23 - Surfaces of the Teeth



imaginary line that divides the oral cavity into right and left halves. The mesial surface of one tooth will always be in contact with the **distal surface** of the tooth anterior to it (in front of it), except in the case of central incisors. The side of a tooth that faces away from the midline of the oral cavity is the distal surface. The distal surface of one tooth will always contact the mesial surface of the tooth posterior to it (in back of it).

Facial and Lingual Surfaces

The side or surface of a tooth that faces the inside of the cheeks or lips is known as a **facial surface**. Facial surfaces are further divided into labial surfaces and buccal surfaces.

The facial surface of an anterior tooth that faces the lips is called the **labial surface**. The term "labial" means lips, thus the labial surface faces the lips. The labial surfaces of anterior teeth are the surfaces most fully exposed when a person smiles.

The facial surface of a posterior tooth is called the **buccal surface**. These surfaces face the inside of the cheeks.

The inside surfaces of teeth that face the tongue or the roof of the mouth are generally called the **lingual surfaces**. The term "lingual" is derived from the Latin word for "tongue."

The surface of mandibular teeth that faces the tongue must always be referred to as the lingual surface. The surface of maxillary teeth that faces the tongue may be called the lingual surface or the **palatal surface** because the lingual surfaces of maxillary teeth are facing the roof of the mouth (palate) as well as the tongue.

The surfaces of teeth may be seen on geometric (Figure 4.26) as well as

Fig. 4.24 Surfaces of Anterior Teeth

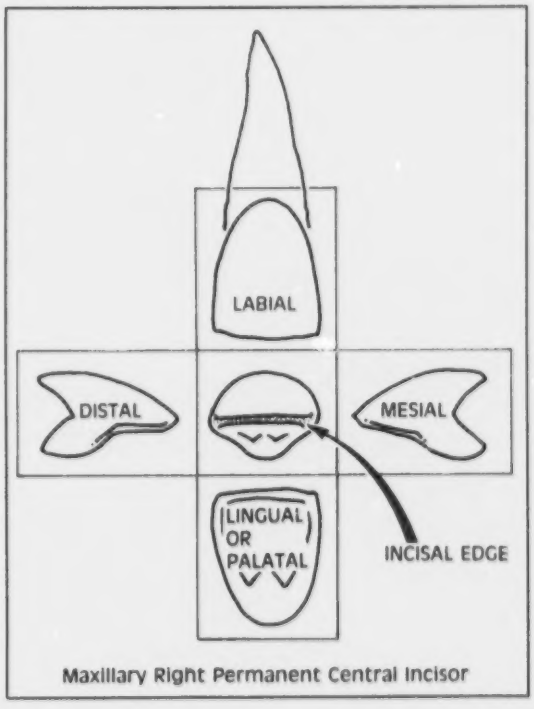


Fig. 4.25 Surfaces of Posterior Teeth

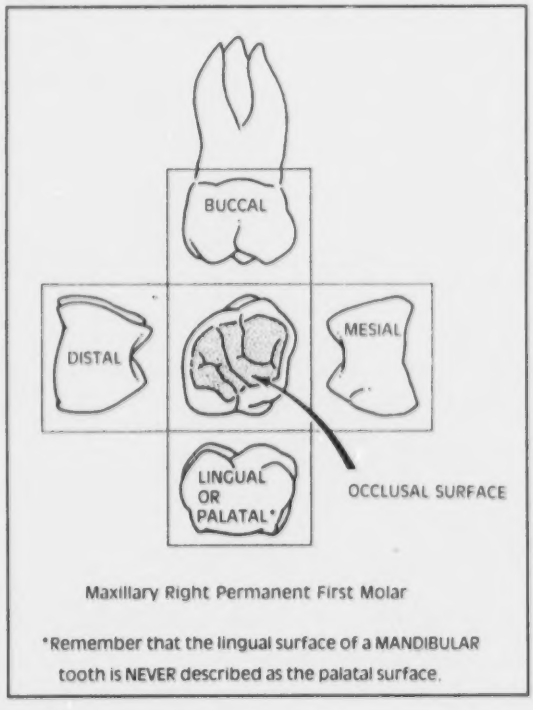
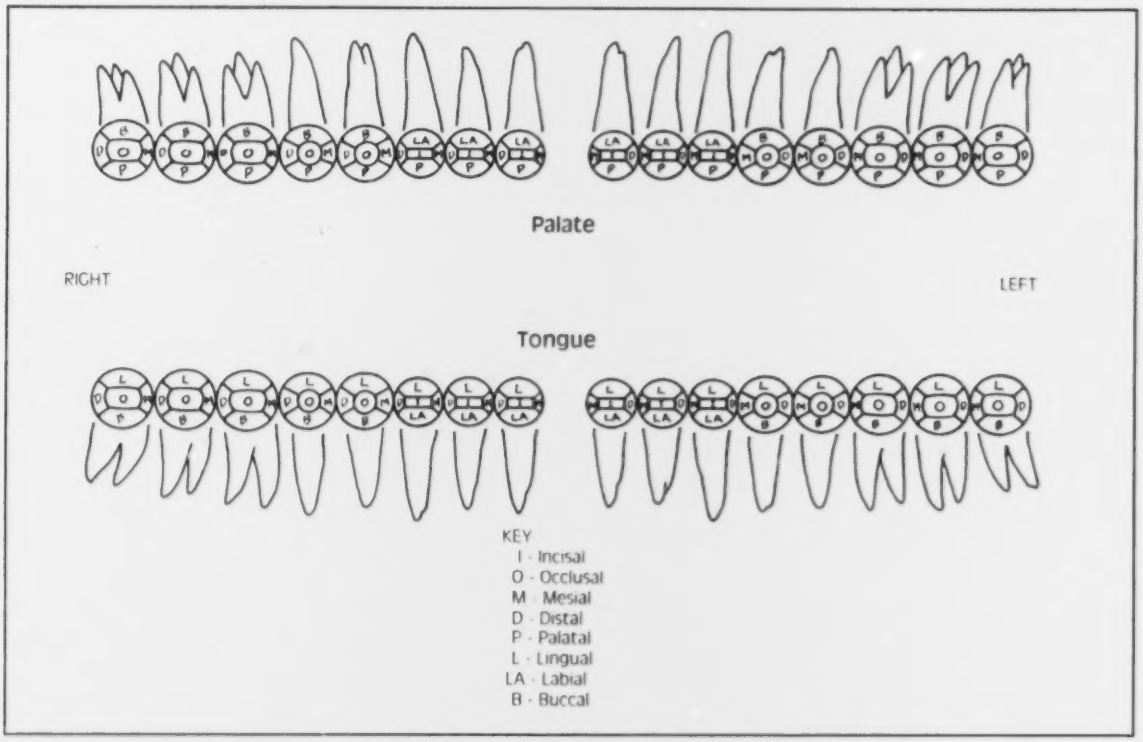

BUCCAL
DISTAL
MESIAL
LINGUAL OR PALATAL*
OCCLUSAL SURFACE
Maxillary Right Permanent First Molar
*Remember that the lingual surface of a MANDIBULAR tooth is NEVER described as the palatal surface.

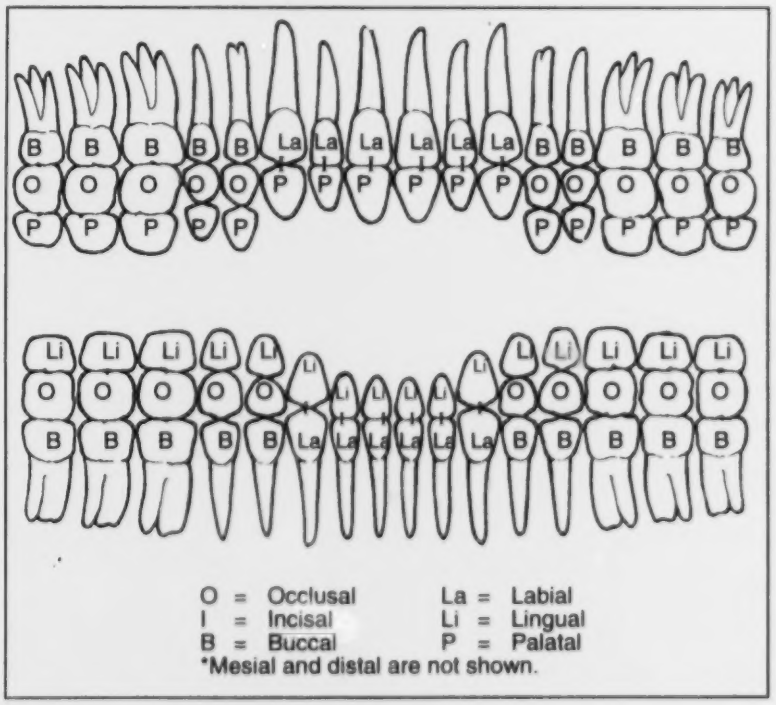
Fig. 4.26 Linear Geometric Chart



anatomical (Figure 4.27) charts. An anatomical chart presents the actual anatomy of the teeth. A geometric chart divides the teeth into five distinct areas but does not duplicate tooth anatomy. Dental offices may use either type of chart, depending on personal preference. The dental aide must be able to identify the teeth and their surfaces on either type of chart.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Fig. 4.27 - Linear Anatomical Chart

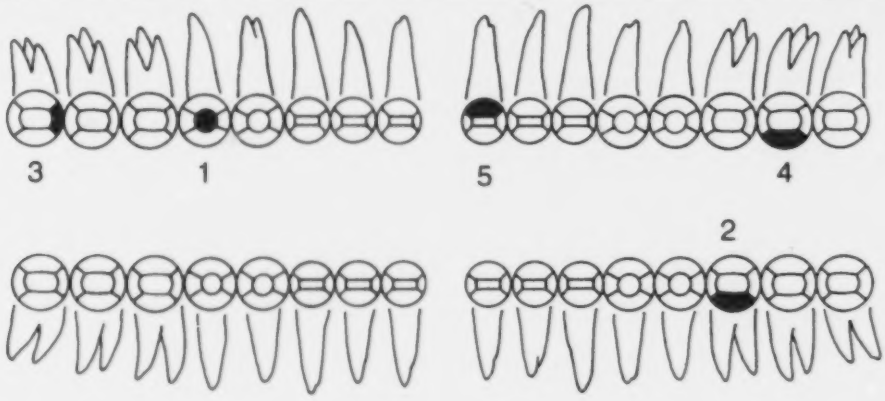


Lesson 4: Surfaces of Teeth

Activity Sheet

Student Name _____ Date _____

Identify the numbered teeth and darkened surfaces on the linear geometric chart.



1. TOOTH: _____

   SURFACE: _____

2. TOOTH: _____

   SURFACE: _____

3. TOOTH: _____

   SURFACE: _____

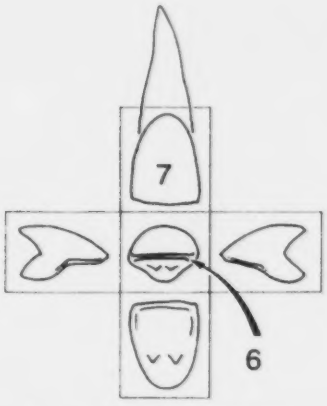
4. TOOTH: _____

   SURFACE: _____

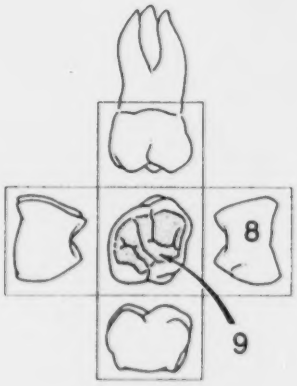
5. TOOTH: _____

   SURFACE: _____

Identify the numbered tooth surfaces.



Maxillary Right Permanent Central Incisor



Maxillary Right Permanent First Molar

6. _____ 7. _____

8. _____ 9. _____

Clinical/Laboratory Activities

1. At your clinical site, discuss charting with a dental assistant. After obtaining permission, pull several dental charts from the files. Is there a standard method for marking and identifying patients' dental history? Yes No Explain.

_____

_____

_____

Lesson 5: Notation Systems

Objective:

Identify the permanent and primary teeth according to the Universal Notation System.

Key Terms:

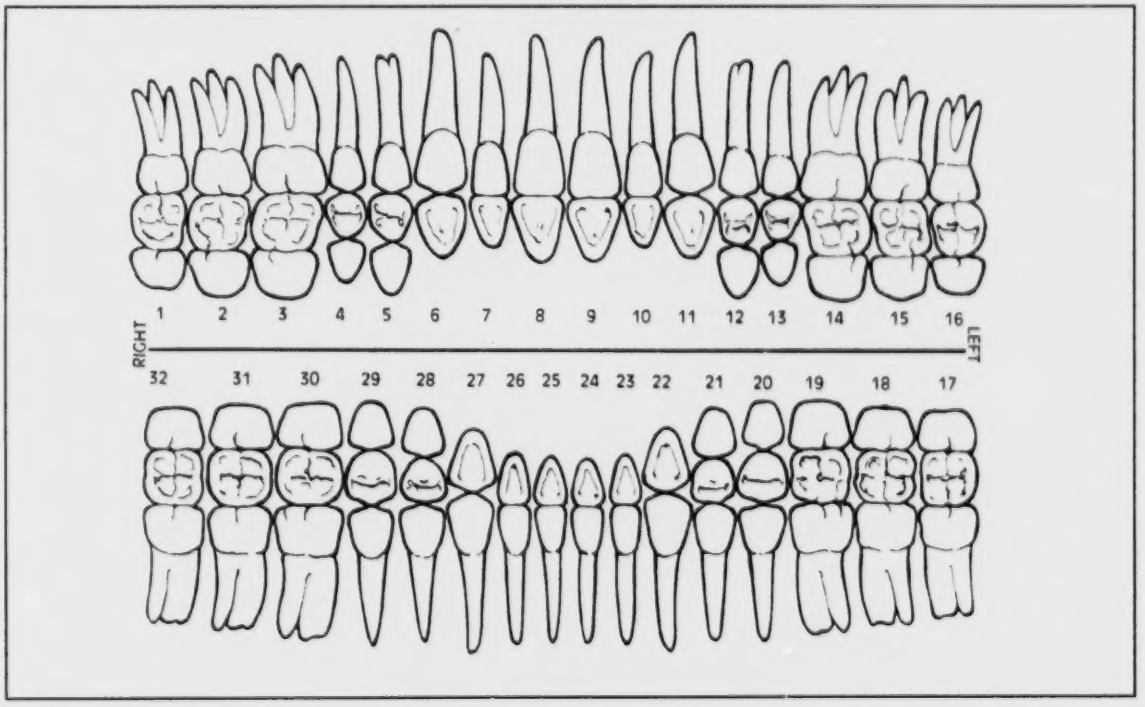
- Universal Notation System
- Mixed Dentition

The appropriate manner in which to identify teeth by their proper names (quadrant, then name of the tooth) can become tedious when working on a different tooth every few minutes. Notation systems that identify teeth either by a letter or number have been developed in order to streamline identification of teeth for dental personnel. It is much more efficient to say or write "#15" than "Maxillary Left Second Molar." This lesson will introduce you to the most commonly used notation system.

Universal Notation System

The notation system endorsed by the American Dental Association is the Universal Notation System. Figure 4.28 shows a linear anatomical chart with the Universal Notation System listed by the teeth. The **Universal Notation System** for permanent teeth identifies the teeth beginning at the patient's maxillary right third molar, which is #1. Numbering continues across the arch until it reaches the maxillary left third molar which is #16. The system then drops directly down to the mandibular left third molar which is #17. It crosses the arch to reach #32, the mandibular right third molar. At first, it is awkward to remember which tooth is

Fig. 4.28 - Universal Notation System for Permanent Teeth



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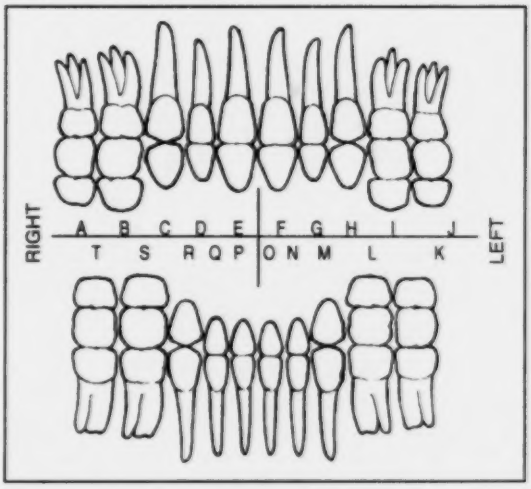
which number. The dental aide must memorize the number for each tooth, though, as this is the method used in dental offices to identify teeth to other dental personnel as well as on the patient's chart.

If a tooth has been extracted or is otherwise missing, the next tooth in line is NOT assigned the number for the missing tooth. For example, if a patient has lost the maxillary right second premolar (#4), the maxillary right first premolar does not become #4. It is still #5, and #4 is said to be "missing." Note: Remember that the right side of a patient's chart represents the left side of the patient's mouth (mirror effect).

Fig. 4.29 - Universal Notation System for Deciduous Dentition



The Universal Notation System for deciduous dentition identifies the teeth by letter. The maxillary right deciduous second molar is A, and the maxillary left deciduous second molar is J. The mandibular left deciduous second molar is K, and the mandibular right deciduous second molar is T. Figure 4.29 shows an anatomical chart with the Universal Notation System for deciduous dentition.

Between the ages of approximately six and twelve, patients will have **mixed dentition**, that is some permanent teeth and some deciduous teeth. Their dental charts will reflect this combination (Figure 4.30). For example, the doctor and assistant may fill #3 and A on a single patient in the same appointment because the permanent first molars erupt around the age of six.

Fig. 4.30 - Mixed Dentition with Universal Notation

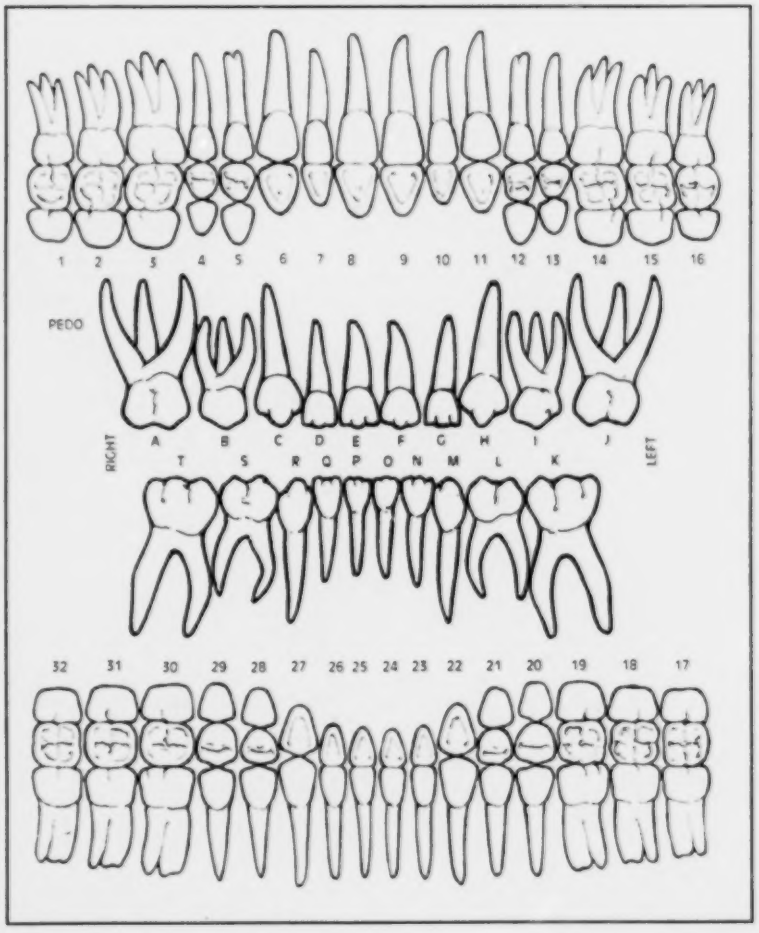
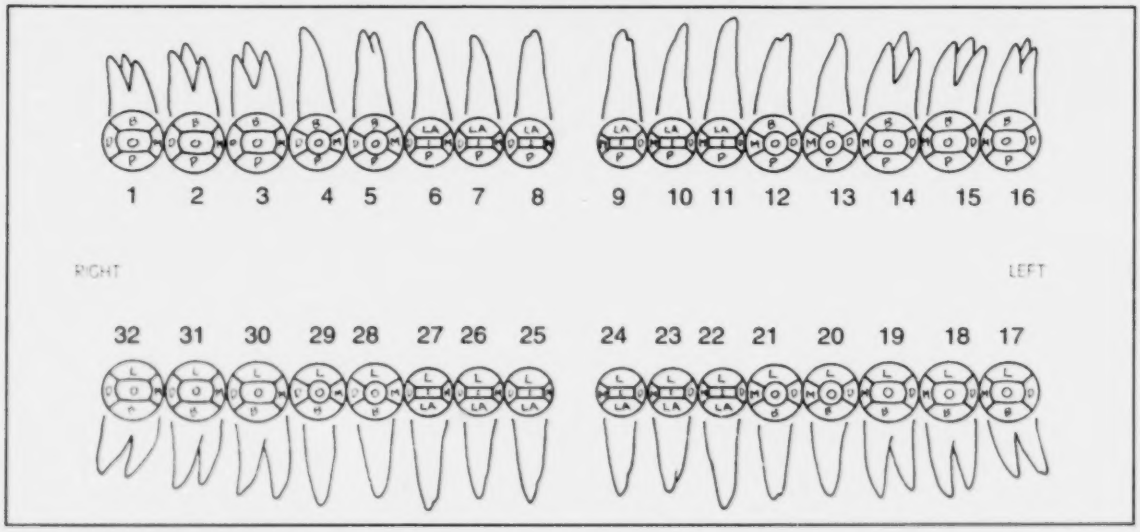


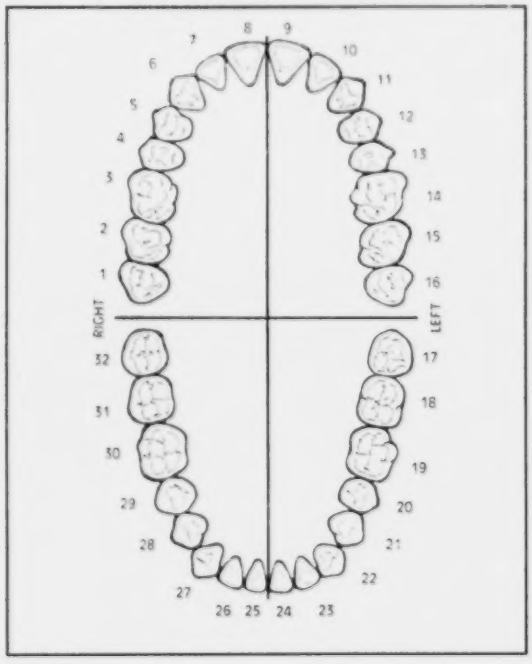
Fig. 4.31 - Linear Geometric Chart with Universal Notation System



Notation systems may be applied to linear or circular (Figures 4.31 and 4.32) tooth charts.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Fig. 4.32 - Circular Anatomical Chart with Universal Notation System



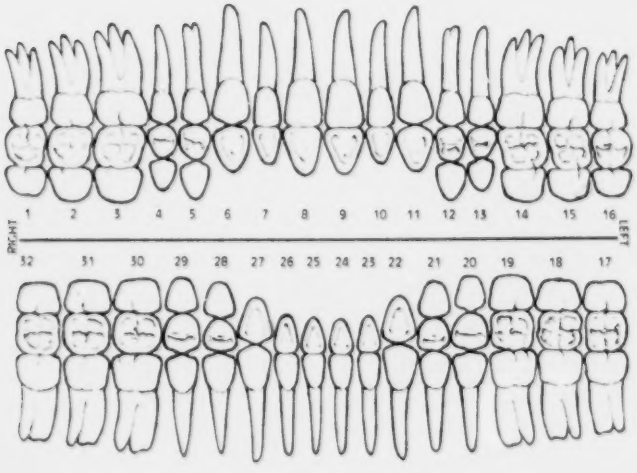
Lesson 5: Notation Systems

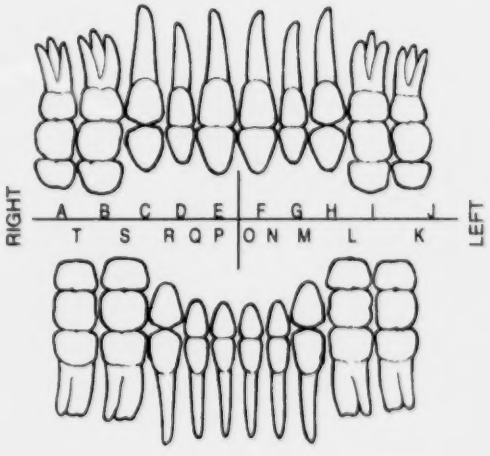
Activity Sheet

Name _____ Date _____

Provide the notation symbol for the following teeth on the lines provided:

1. _____ Mandibular right deciduous cuspid.
2. _____ Maxillary left permanent second premolar.
3. _____ Maxillary left deciduous first molar.
4. _____ Mandibular right permanent lateral incisor.
5. _____ Maxillary right deciduous central incisor.
6. _____ Maxillary right permanent first premolar.
7. _____ Mandibular left deciduous second molar.
8. _____ Mandibular left permanent first molar.
9. _____ Maxillary right deciduous second molar.
10. _____ Mandibular right permanent first molar.





Clinical/Laboratory Activities

1. After checking with your clinical supervisor, view the notation system or systems used on patient charts. What types were used?

Lesson 6:
Anatomical Parts and Tissues of Teeth

Objectives:

A. Identify the parts of a tooth on a diagram.

B. Identify the tissues that compose tooth structure on a diagram.

C. Identify key terms and their definitions.

Key Terms:

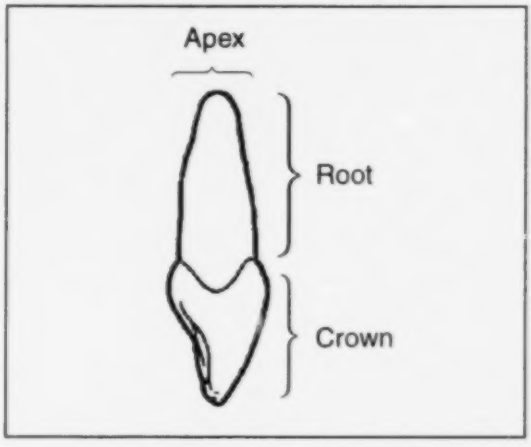
- Apex (´a peks)
- Apical (ā p´ ĭ kal) Foramen (fō-rā´ mĕn)
- Pulp
- Calcified (kăl´ sĭ fĭd)
- Cementum (sē mĕn´ tŭm)
- Crown
- Enamel (in ´am ŭl)
- Caries (kā´ rēēz)
- Cusp (kŭsp)
- Dentin (dĕn´ tĭn)

In order to understand the procedures that benefit patients, the dental aide must be familiar with the basic physiology of tooth structure. In this lesson, you will learn the anatomical parts of teeth and the tissues that compose each component of tooth structure.

Parts of Teeth

Each tooth has several elements and landmarks. The outside structure of a tooth consists of the root, the apex, and the crown. (Figure 4. 33) All teeth have roots, for example, but not all teeth have the same number of roots. All incisors and

Fig. 4.33 - Outside Tooth Structure



premolars have one root. The mandibular molars and maxillary first premolars have two roots. The maxillary molars have three roots.

The tip of each root is called the **apex**. There is an opening at the apex called the **apical foramen** that is a passageway for nerves and blood vessels to enter and leave the tooth. **Pulp** is the innermost tissue of the tooth. It is the softest tissue of the

Fig. 4.34 - Examples of Roots

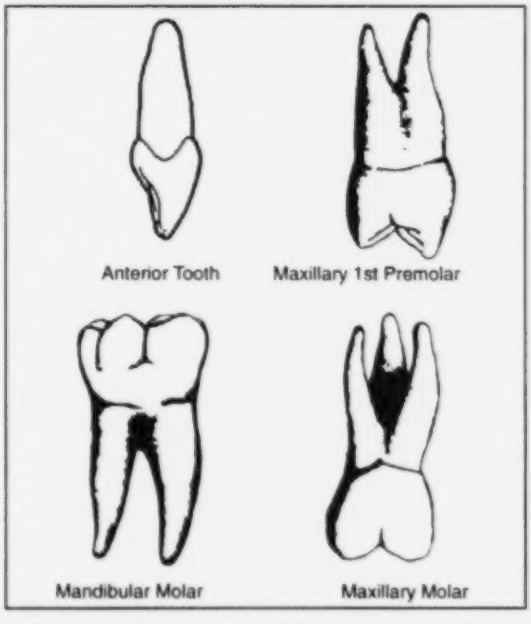
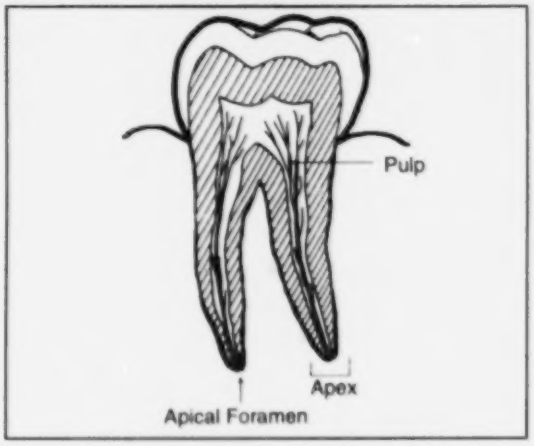


Fig. 4.35 - Pulp and Apex



tooth and the only tissue that is not **calcified** (made of hardened bone-like material). The soft pulp perceives any painful sensation that may threaten its life. Blood vessels carrying nutrients to the pump enter and leave the tooth through the apical foramen.

The root of the tooth is covered by a hard tissue known as **cementum**. The cementum plays a role in keeping the tooth within the socket. Because cementum is not as hard as enamel, it will decay faster when exposed in the oral cavity.

Fig. 4.36 - Cementum

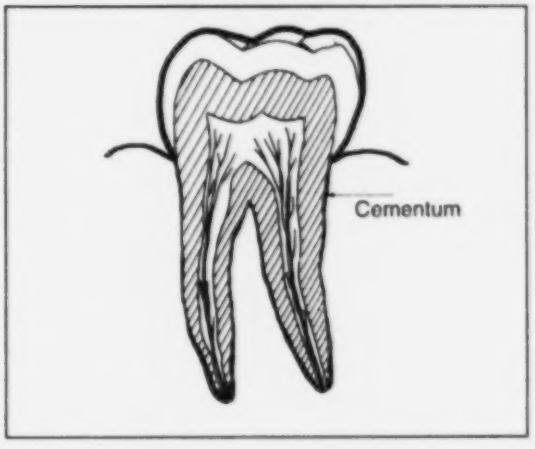
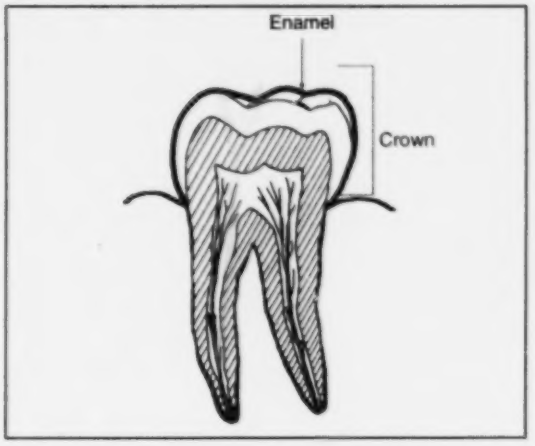
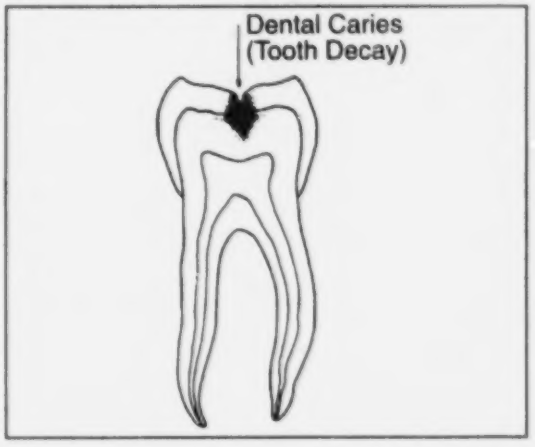


Fig. 4.37 - Crown and Enamel



The **crown** of a tooth is the part that is normally visible within the oral cavity. The crown is covered by hard tissue known as **enamel**. Enamel, the hardest tissue in the human body, protects the tooth from damage. If enamel is damaged, however, it cannot repair itself. An example of damage to enamel is tooth decay, or dental **caries**.

Fig. 4.38 - Dental Caries



The crowns of posterior teeth have **cusps**, which are rounded points on the occlusal surface (Figure 4.39). Posterior teeth may have two, three, four, or five cusps, depending on the type of tooth.

Fig. 4.39 - Cusps

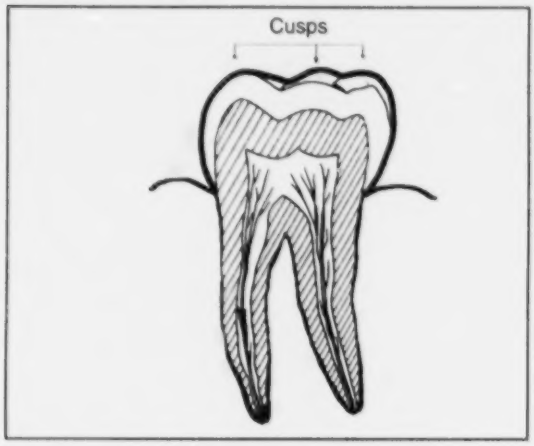
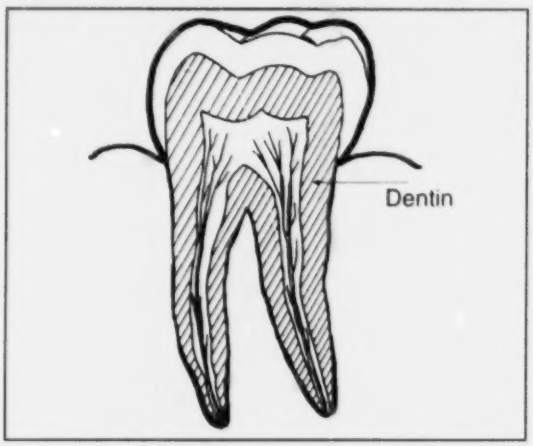


Fig. 4.40 - Dentin



The second hardest tooth tissue is **dentin**. Dentin is located entirely within the tooth and protects the soft tissue that lies beneath it (Figure 4.40). If the dentin is entirely destroyed by decay, the tooth will die.

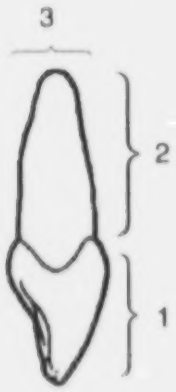
Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

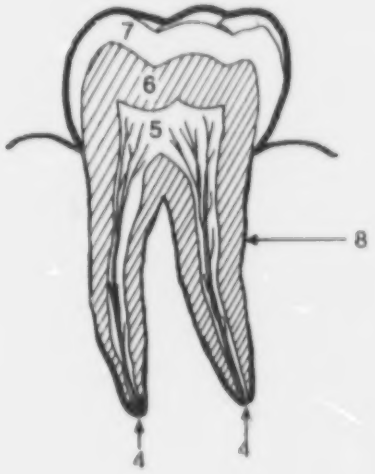
Lesson 6: Anatomical Parts and Tissues of Teeth

Activity Sheet

Name _____ Date _____

Name the numbered structures as directed in the spaces provided.





1. _____
2. _____
3. _____
4. _____
5. Name the tissue that occupies the space _____
6. _____
7. _____
8. _____

Clinical/Laboratory Activities

1. At your clinical site, discuss with the dentist the importance of knowing the basic structures of the teeth.

Lesson 7:
Factors Influencing Dental Health

Objectives:

A. Identify the causes and prevention of dental caries.

B. Identify the causes and prevention of periodontal disease.

C. Identify the benefits of fluoride treatments.

D. Demonstrate the proper methods for brushing and flossing teeth.

Key Terms:

- Dental Caries (kā´ rē ēz)
- Plaque (plăk)
- Twenty-Minute Acid Attack
- Calculus (kal kyŭ lŭs)
- Gingiva (jĭn´ jĭ vah)
- Gingivitis (jĭn˝ jĭ vī´ tĭs)
- Fluoride (flū-or´ īd)

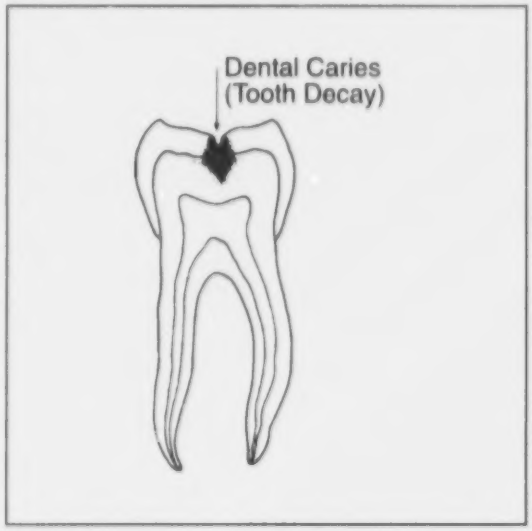
The dental aide should be aware of the causes and preventive methods of the most common pathogenic (disease causing) conditions encountered in the dental office. The dental aide may be called to show patients how to brush and floss correctly or to discuss the cause of tooth decay or gum disease. This lesson will introduce you to these conditions and discuss methods of prevention.

Tooth Decay

Dental caries is the proper name for tooth decay, or cavities, in the teeth. Caries are caused by the buildup of plaque on the teeth and the consumption of sugars and starches.

Plaque is a colorless, doughy collection of bacteria found in the mouth. Bacteria in plaque like to eat sugars and starches. Whenever people eat, bacteria in plaque are eating, too. After bacteria eat, they excrete acid onto the teeth for about twenty minutes. This process is called the **Twenty-Minute Acid Attack**. The acid produced by the bacteria will eventually break down the enamel on teeth, causing caries to develop.

Fig. 4.41 - Tooth Decay



Tooth decay can be prevented by regular removal of plaque by brushing and flossing and by limiting the intake of sweets and starches.

The teeth should be brushed with a soft toothbrush at least in the morning and before bed. To brush properly, the toothbrush should be held at a slanted angle to the gumline on facial surfaces, then gently moved in very small circles, brushing two or three teeth at a time. The bristles of the toothbrush should be kept on the teeth and not spread out on the

Fig. 4.42 - Brushing Technique

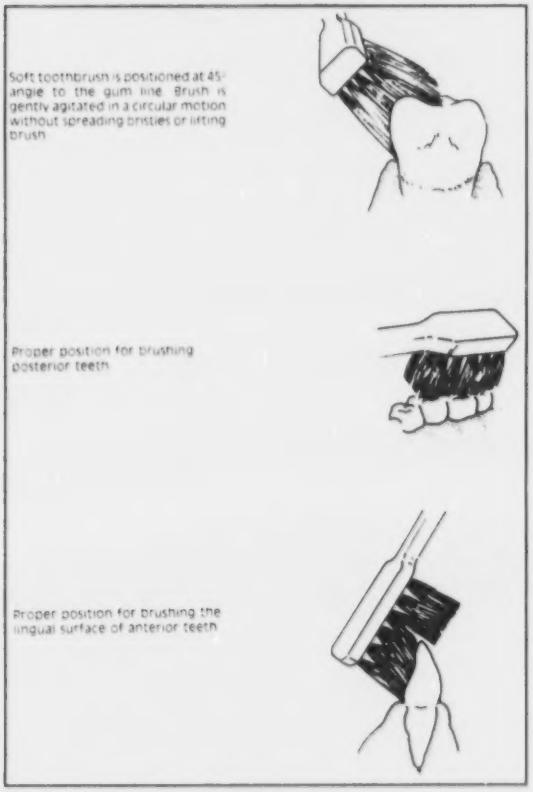
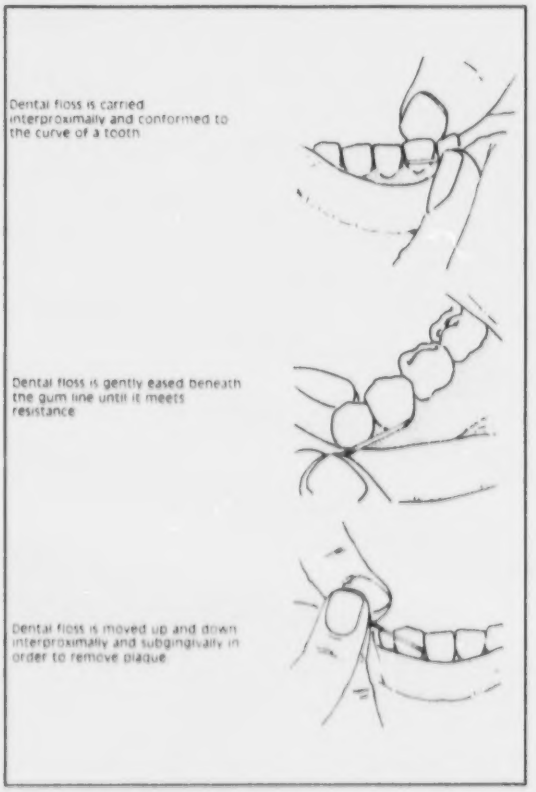

Soft toothbrush is positioned at 45° angle to the gum line. Brush is gently agitated in a circular motion without spreading bristles or lifting brush.
Proper position for brushing posterior teeth.
Proper position for brushing the lingual surface of anterior teeth.

Fig. 4.43 - Flossing Technique


Dental floss is carried interproximally and conformed to the curve of a tooth.
Dental floss is gently eased beneath the gum line until it meets resistance.
Dental floss is moved up and down interproximally and subgingivally in order to remove plaque.

gums. On occlusal surfaces, the bristles may be brushed back and forth. On lingual surfaces, the bristles can be held vertically on anterior teeth or horizontally on posterior teeth.

Any toothpaste carrying the American Dental Association seal of approval is adequate for toothbrushing.

Dental floss is used to remove plaque between the teeth and under the gums where a toothbrush cannot reach. About eighteen inches of dental floss may be wrapped around the index fingers, then gently placed between the teeth and under the gums around each tooth. The floss must be placed under the gumline to remove plaque that builds up. Plaque under the gumline can cause periodontal disease.

To limit acid production, snacking between meals should be avoided. If snacks are consumed between meals, they should be eaten all at once, rather than eating one pretzel at 10:00 a.m., then another one at 10:30 a.m., for example. This practice causes forty minutes of acid production instead of twenty minutes. Even if an entire bag of pretzels is eaten at once, only one Twenty-Minute Acid Attack will occur. Sweet drinks and fruit juices will also cause acid attacks, so they, too, should be consumed all at once instead of sipped on throughout the day.

Periodontal Disease

Periodontal disease is also caused by bacteria in plaque and the buildup of **calculus** (tartar) at and under the

Fig. 4.44 - Gingivitis

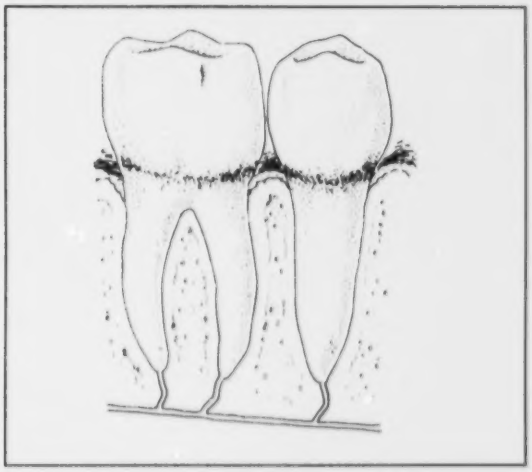
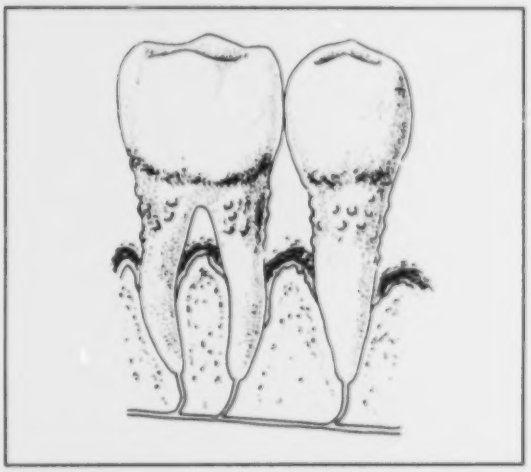


Fig. 4.45 - Periodontitis



gumline. This disease inflames the **gingiva** (gums) and destroys the bone in which the teeth are rooted. The term "periodontal" means "around the teeth," thus periodontal disease affects the tissues surrounding the teeth.

When plaque is left undisturbed at and under the gumline for more than a day, bacteria begin to infect the gums. This condition is known as **gingivitis,** which means inflammation of the gums. The most common symptom of gingivitis is bleeding of the gums during toothbrushing and flossing. If plaque is left undisturbed for more than a day, it begins to harden into calculus (tartar). Calculus is simply plaque that has absorbed minerals from saliva and has hardened. It forms above and under the gums, irritating the gums and worsening infection.

When periodontal disease spreads to the bone, it begins destroying the bone. At this stage, the condition is called periodontitis. If the condition is not cured, bone loss continues until the teeth loosen and fall out.

Prevention of periodontal disease is simple. Plaque must be kept away from the gums through daily flossing and brushing. Unlike brushing, the teeth need flossing only once a day. Gingivitis can be cured within ten days to two weeks by proper daily home care, but the infection will return if daily flossing stops. If the gums bleed during flossing or brushing, the tissue is inflamed, and plaque is not being removed from around and under the gums.

Other preventive measures include seeing the dentist every six months for a check-up and cleaning of the teeth.

Mouthwashes and toothpastes that contain fluoride can also help prevent decay because fluoride makes teeth more resistant to breakdown by bacterial acids. **Fluoride** is a mineral found in the earth's crust that may be added to toothpastes, mouthrinses, and even the water supply to prevent dental caries.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written evaluation for this unit. A score of 80 percent indicates you have mastered this material and may proceed to the next unit.

Lesson 7: Factors Influencing Dental Health

Activity Sheet

Name _____ Date _____

Write answers to the following questions using information covered in this lesson.

1. How do the bacteria that live in plaque contribute to the formation of dental caries?

_____

_____

_____

2. Why should you advise patients to drink their juice all at once instead of sipping on it throughout the day?

_____

_____

3. How does fluoride help prevent tooth decay?

_____

4. Why is dental floss important in the prevention of periodontal disease?

_____

_____

5. What is the most common symptom of gingivitis?

_____

_____

6. How does the formation of calculus contribute to periodontitis?

_____

7. What will happen if periodontal disease is left untreated?

_____

Clinical/Laboratory Activities

1. If approved by clinical supervisor, observe the dental hygienist while he or she is performing a cleaning and checkup on a patient.

   a. What questions did the hygienist ask the patient?

   _____

   _____

   _____

   _____

   _____

   b. What information did the hygienist tell the patient?

   _____

   _____

   _____

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Arches, Planes, and Quadrants Rating _____

Comments: _____

_____

_____

Activity Sheet #2: Names, Types, and Functions of Teeth Rating _____

Comments: _____

_____

_____

Activity Sheet #3: Primary Dentition Rating _____

Comments: _____

_____

_____

Activity Sheet #4: Surfaces of Teeth Rating _____

Comments: _____

_____

_____

Activity Sheet #5: Notation Systems Rating _____

Comments: _____

_____

_____

Activity Sheet #6: Anatomical Parts and Tissues of Teeth Rating _____

Comments: _____

_____

_____

Activity Sheet #7: Factors Influencing Dental Health Rating _____

Comments: _____

_____

_____

Unit Written Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit V

Operative Equipment

After completing this unit, you should be familiar with the design, style, and purpose of equipment and instruments used in the practice of dentistry. The dental aide can be a great asset in preparing and setting up the instruments in the treatment room to facilitate operative procedures.

Unit Lessons

Dental Operatory

Seating and Dismissal of Patients

Restorative Procedures

Surgical Procedures

Lesson 1: Dental Operatory

Objectives:

A. Identify the three chairs or stools used in a dental operatory.

B. Identify the functions and attachments of two types of handpieces used in dentistry.

C. Identify the five major bur designs.

D. Identify the three functions of the 3-way syringe.

E. Identify the uses of the two types of evacuation systems used in dentistry.

F. Identify dental tools and equipment.

G. Match key terms with their definitions.

Key Terms:

- Operatory (op´er-ah-tor˜ē)
- Restorative (ri-´stōr-ŭt-iv) Dentistry
- Amalgam (ah-mal´găm)
- Composite (kŏm-´paz-ŭt/kŭm)
- Handpiece
- Burs (bŭrz)
- 3-Way Syringe(sĭ-rĭnj´/sĭr˜ĭnj)
- Evacuator (i-vak-yū-´wā-tor)

Dental operatories, which are also referred to as treatment rooms, are the production areas of the dental office. The operatory equipment is important for maximizing efficiency and maintaining a smooth patient flow throughout the day. The **operatory** consists of a dental chair, assistant stool, operator's stool, dental unit, x-ray unit, operating light, and cabinets or units for the dental equipment. Dental offices vary considerably in design and style of equipment used. They are similar in the respect that all general practices require certain basic instruments and equipment to function.

Dental chair - The dental chair is the center of activity for all treatment. The back of the chair is thin and narrow to allow you to position yourself as close to the patient as possible without excessive leaning. The controls are located at the base so they can be activated with the foot, avoiding cross contamination.

Fig. 5.1 - The Dental Chair

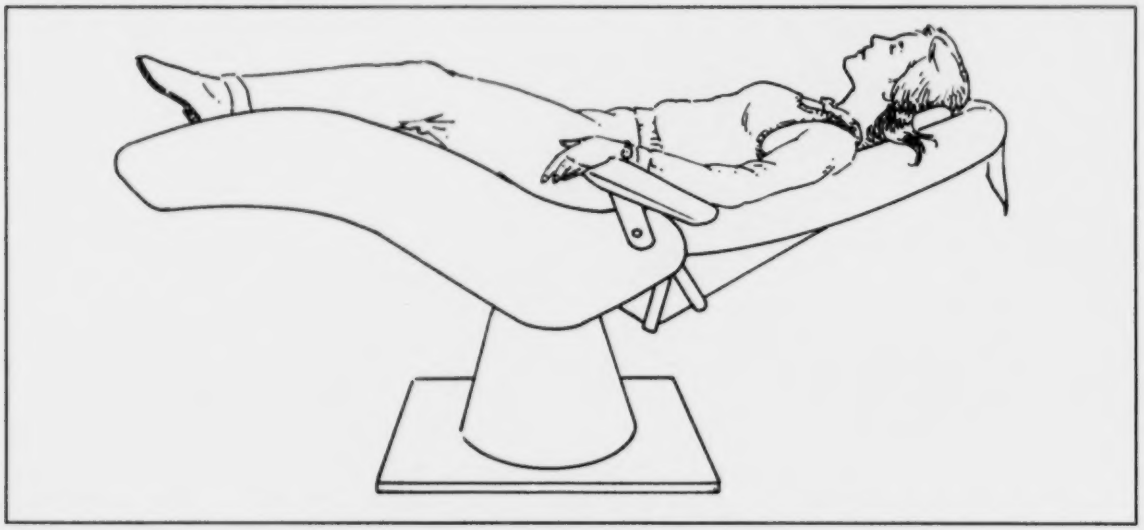


Fig. 5.2 - Operator and Assistant Stools

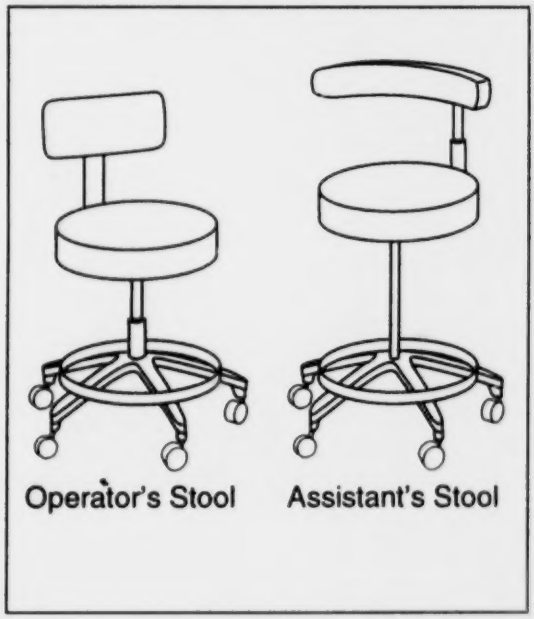
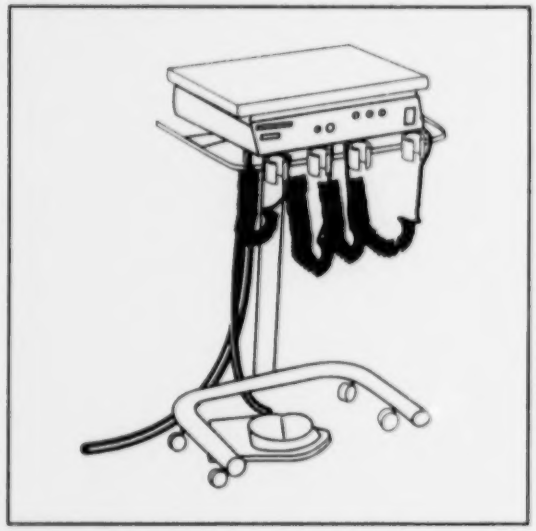


Fig. 5.3 - Mobile Dental Unit



Stools - Stools should be selected so that they can be adjusted both vertically and horizontally to adapt to each individual for comfort and accessibility. The assistant's chair is usually adjusted 5 to 6 inches higher than the operator's chair. The operator's chair may be used by the dentist, the dental hygienist, or a dental assistant who is preparing the patient for a procedure.

Dental unit - A dental unit, whether designed in a cart system or a self-contained unit, is the control center for handpieces, 3-way air/water syringes, and dental evacuation suction systems. The dental unit may be fixed (which cannot be moved) or mobile (which allows movement from one side of the patient to the other).

Handpieces - The dental handpiece is probably the most frequently used instrument when doing restorative dentistry. **Restorative dentistry** includes the process of restoring defects or caries in individual teeth. The two main types of restorations covered in this unit are **amalgam** (silver fillings used on the posterior teeth) and **composite** (white fillings used most commonly on the anterior teeth).

The **handpiece** works on the same principle as a "drill," for it is used to cut or polish tooth structure. The two types of handpieces used in dentistry are the conventional low-speed handpiece and the high-speed handpiece. The conventional low-speed handpiece is a multipurpose handpiece that uses various attachments. It is used for polishing teeth and removing decay. Two of its most common attachments are the contra-angle, which allows access to all areas of the mouth, and the prophylaxis (prophy) angle, which is used exclusively for polishing teeth with a rubber cup. Contra angle burs are held in by friction grip or a latch.

The high-speed handpiece perates with water as a coolant and at a much higher speed than the conventional handpiece. It is used to remove and cut tooth surfaces at a rapid speed. This handpiece uses only friction grip burs. Many of the high-speed handpieces have fiber optic lights mounted in their heads to assist in lighting the

Fig. 5.4 - Handpieces and Attachments

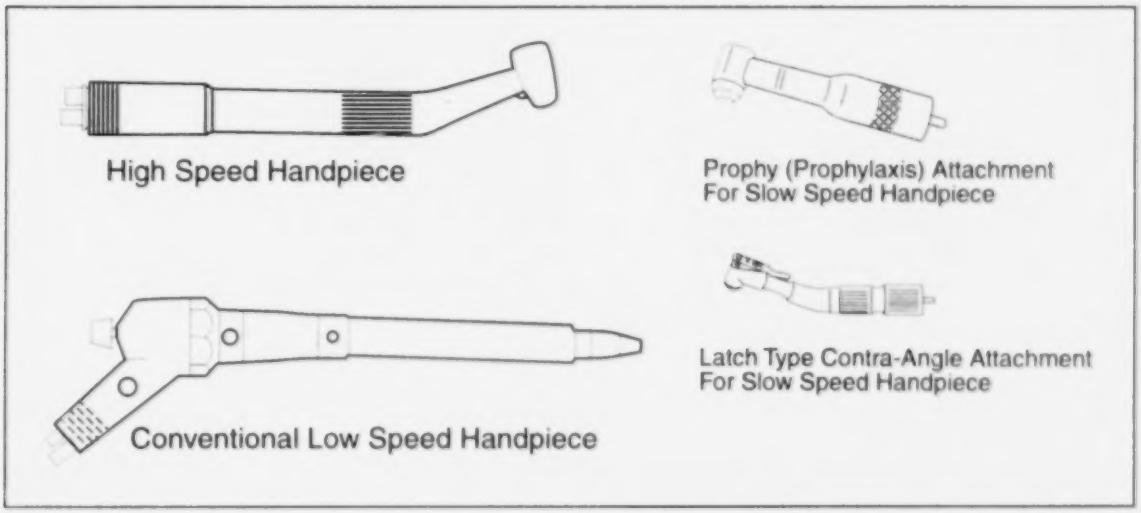
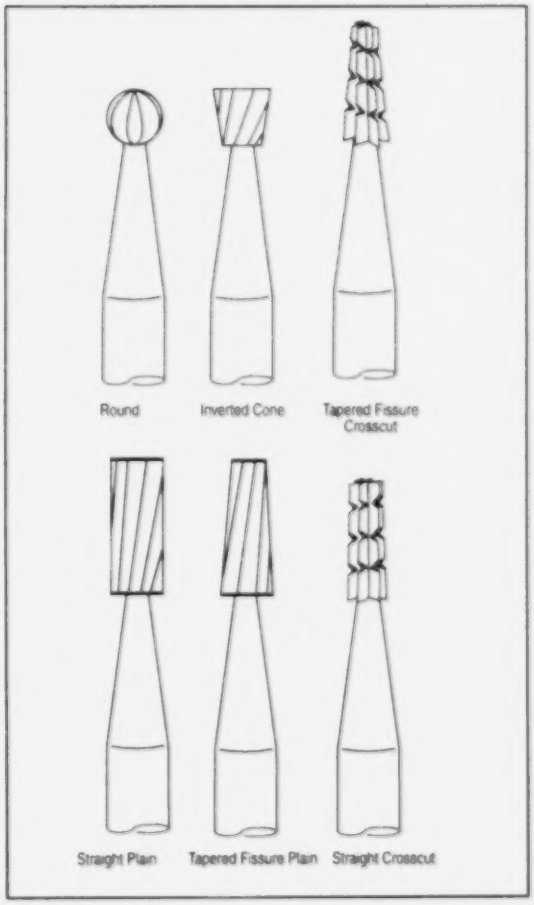


Fig. 5.5 - Bur Head Design



cavity area. All handpieces, attachments, and burs must be sterilized between patient use.

Burs - Rotary instruments used to cut tooth surfaces are most commonly referred to as **burs**. Burs are manufactured in various shapes and sizes for a wide range of functions. The bur of choice is manufactured from carbide steel, preferred because of its ability to retain a sharp edge over repeated usage. The major bur head designs include the following shapes: round, inverted cone, tapered fissure plain, tapered fissure crosscut, straight plain, and straight crosscut. All burs must be sterilized after use.

3-way syringe - The **3-way syringe** is used in three ways. It delivers (1) a stream of water, (2) a stream of air, and (3) a combined spray of air and water. It is one of the greatest time and motion saving instruments used in dentistry today.

Usually the assistant and the doctor each have one for individual use. During clean-up, the tip of the syringe must be removed and sterilized. The handles, the main portion, and the hoses should be cleaned and disinfected after every patient.

Fig. 5.6 - 3-Way Syringe

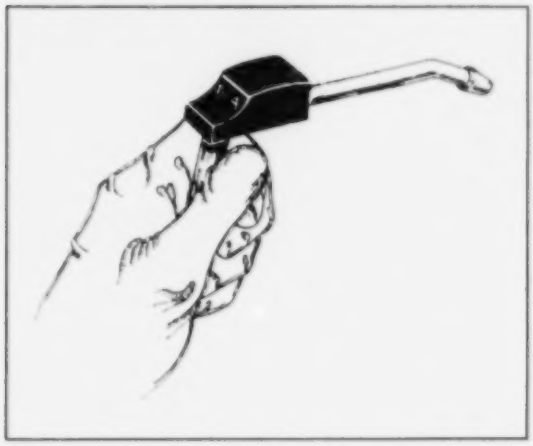
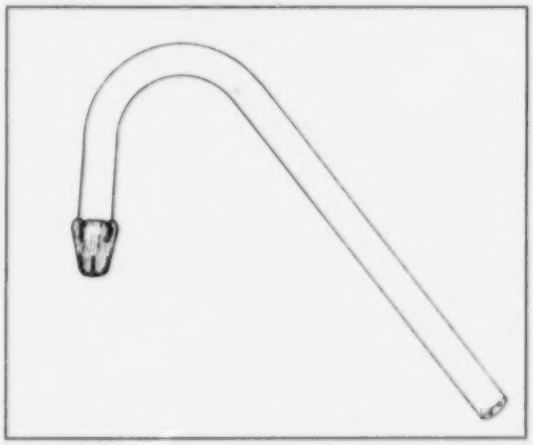


Fig. 5.7 - Saliva Ejector Tip

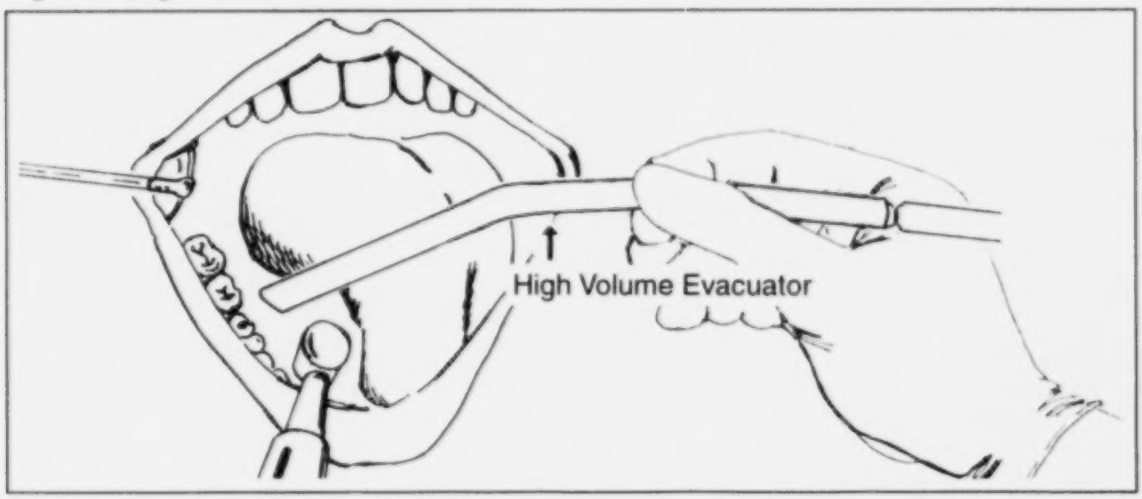


Saliva ejector - The saliva ejector is a low-volume evacuation system used to keep saliva under control when a procedure requires the area to be dry. A disposable plastic tip is shaped to conform to the patient's mouth and is placed on the opposite side from where the operator is working. The handle and hose are cleaned and disinfected after each patient.

High-volume evacuator - The high-volume **evacuator** is used to suction water and debris from the patient's oral cavity. Most dental procedures begin by cleansing the tooth with water. The dental assistant uses the high-volume evacuator to remove the accumulating water and to retract the cheek and tongue from the field of operation. The evacuator has a removable tip that is sterilized or discarded. The handle and tubing are cleaned and disinfected after each patient. The tubing to the central vacuum system should be rinsed with a cleaning solution.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Fig. 5.8 - High-volume Evacuator



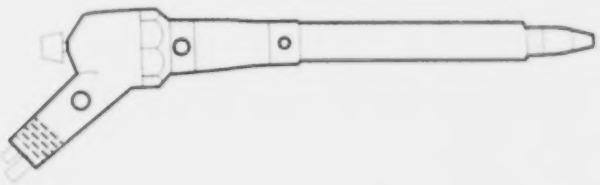
Lesson 1: Dental Operatory

Activity Sheet

Match the correct handpiece or attachment in Column A with the characteristic in Column B.

COLUMN A	COLUMN B
A. High-Speed	____ 1. Uses only friction grip burs.
B. Conventional Low-Speed	____ 2. Polishes teeth with a rubber cup.
C. Prophylaxis Angle	____ 3. Multipurpose handpiece that uses attachments.
D. Contra-Angle	____ 4. Removes and cuts tooth surface at a rapid speed.
	____ 5. Many have fiber optic light mounted in the head.
	____ 6. Attachment that allows access to all areas of the mouth.

Identify the following handpieces, attachments, and burs.



7. _____

8. _____

Identify the following handpieces, attachments, and burs.

9. _____

10. _____

11 _____

12. _____

13. _____

14. _____

15. List the three (3) functions of the 3-way syringe.

    a. _____

    b. _____

    c. _____

Place a T for true if the statement is correct and an F for false if the statement is incorrect.

16. ___ The operator's stool is 5 to 6 inches higher than the assistant's.

17. ___ The dental unit is the control center for handpieces, 3-way syringes, and evacuation systems.

18. ___ The high-volume evacuator system is used to remove excessive water and debris from the mouth.

19. ___ The saliva ejector is used when a procedure requires the area to be dry.

20. ___ The high-volume evacuator has a plastic tip that is shaped to conform to the patient's mouth.

21. ___ The tubing for the central vacuum system should be rinsed with a cleaning solution.

Clinical/Laboratory Activities

1. Check with your clinical supervisor about examining the handpieces, attachments, and burs. Check out the dental unit so you can become familiar with the location of various parts including on and off switches.

Lesson 2: Seating and Dismissal of Patients

Objectives:

A. Seat the dental patient in preparation for treatment or examination.

B. Dismiss the dental patient after a treatment or examination.

Steps of Procedure for Seating a Patient:

1. Greet the patient in the reception area and escort him/her to the operatory.

2. Lower the dental chair approximately to knee level, with the back upright and the arm raised.

3. Ask the patient to be seated, and lower the chair arm.

4. Drape the patient with a disposable drape.

5. Slowly adjust the chair into proper position. Always advise the patient of any chair movement.

6. Attempt to initiate pleasant conversation to make the patient feel comfortable and relaxed.

7. Prepare and have in place the patient's chart, radiographs, necessary instruments, and supplies.

Steps of Procedure for Dismissal of the Patient:

1. Allow the patient to rinse and freshen his/her mouth after the dental procedure is completed.

2. Wipe the patient's face clean of any debris or smudges, if necessary. Give post-operative instructions, if applicable.

3. Move all equipment (light, operatory stools, and cart systems) out of the way. Slowly return the dental chair to the upright and lowered position. Again, advise the patient of any chair movement.

4. Raise the arm of the chair and remove the patient's drape.

5. Return any personal belongings to the patient.

6. Courteously assist the patient from the chair.

7. Dismiss the patient and escort him/her to the reception area.

8. Clean and disinfect the operatory/treatment room according to the procedures in Unit III, Infection Control.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 2: Seating and Dismissal of Patients

Activity Sheet

1. List the seven (7) steps of procedure for seating a patient.
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____
   g. _____
2. List the eight (8) steps of procedure for dismissing a patient.
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____
   g. _____
   h. _____
3. Why do you think it is so important to make a good impression on your patients when seating them for treatment? _____

   _____

   _____

Clinical/Laboratory Activities

1. Practice the procedures for seating and dismissing patients. With your clinical supervisor's okay, seat a patient for a cleaning or a treatment. After the cleaning or treatment, dismiss the patient.

Lesson 3:
Restorative Procedures

Objectives:

A. Identify the names and uses of instruments.

B. Prepare a tray for basic setup.

C. Prepare a tray for amalgam restoration.

D. Prepare a tray for composite restoration.

E. Prepare a tray for local anesthesia.

F. Match key terms to their correct definitions.

Key Terms:

- Periodontal (per´ē-ōdon´tal) Probe
- Amalgam (ah-mal´găm) Restoration
- Amalgam Condenser
- Burnishers (bŭr-nish)
- Composite (kahm-pŏz-ūt) Restoration
- Local Anesthesia (ăn´ĕs-thē´zē-ah)
- Topical (tŏp-i-kŭl) Anesthesia
- Aspirating (ăs´pĭ-rāt) Syringe

Basic Setup for All Procedures

The basic setup for almost every dental procedure includes a mouth mirror, explorer, and cotton pliers. Virtually all instrument tray setups include these three instruments. The basic setup is always out and ready for any dental examination or operative procedure. The peridontal probe is sometimes included in the basic setup for an adult examination.

Fig. 5.9 - Basic Setup for Exam

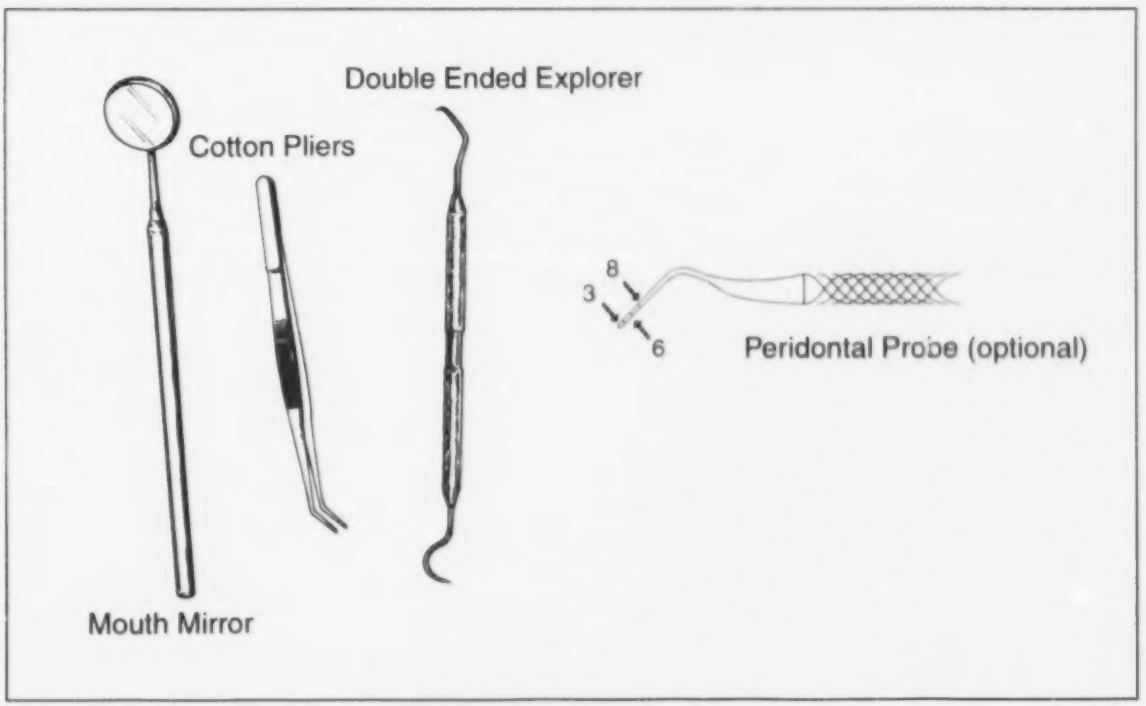


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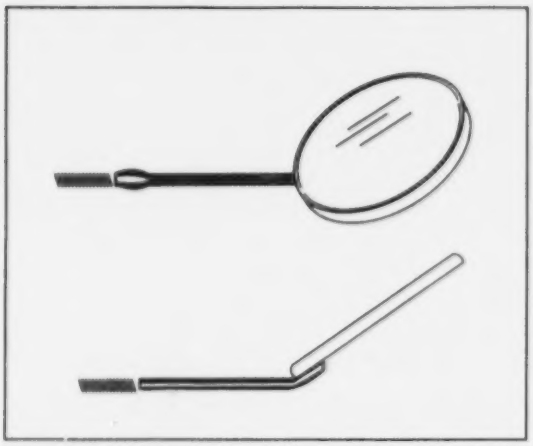
Fig. 5.10 - Mouth Mirror

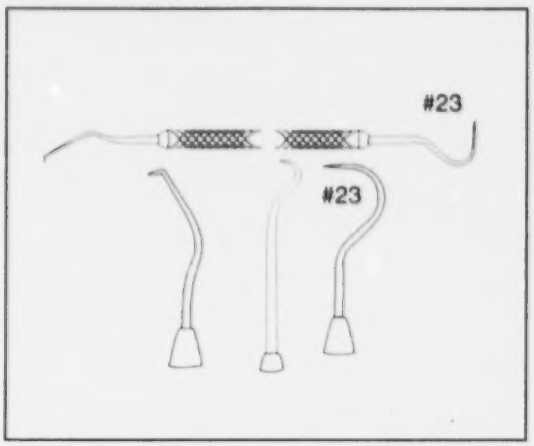


Mouth mirror - The dental mouth mirror is a multipurpose instrument. Its main purpose is to allow the dentist to see into the oral cavity by indirect vision. Mirrors are also helpful to reflect light into the area being examined or treated. The mirror may also be used to retract (push aside) the tongue or cheek. The face of the mirror is available in various sizes. Size 2 is the smallest diameter, and size 6 is the largest.

Dental explorers - The dental explorer is an instrument used as a probe to examine the teeth. Explorers have a very fine tip on the working end. This fine tip allows the dentist to feel various discrepancies on the surface of the tooth. Besides probing the teeth, it is also helpful in removing excessive cement from cast restorations and carving small areas of amalgam restorations. There are several styles and shapes of explorers available. The number 23 style explorer is most commonly used.

Cotton pliers - Cotton pliers (forceps) are used to place and remove small sized materials, such as cotton pellets, wedges, and cotton rolls, in the oral cavity. They are also used when removing items from containers or drawers to prevent cross contamination. There are curved, straight, and self-locking cotton pliers.

Fig. 5.11 - Explorers



The **periodontal probe** is not usually considered part of the basic setup but is routinely used during an adult examination. The periodontal probe is a measuring device used to determine if the patient has peridontal disease. The instrument has markings of 3 mm, 6 mm, and 8 mm from the tip. A depth reading is determined by inserting the instrument subgingival (under the gum line). The depth is recorded on the patient's chart. Normal depth readings should only be 2 mm to 3 mm.

Fig. 5.12 - Cotton Pliers

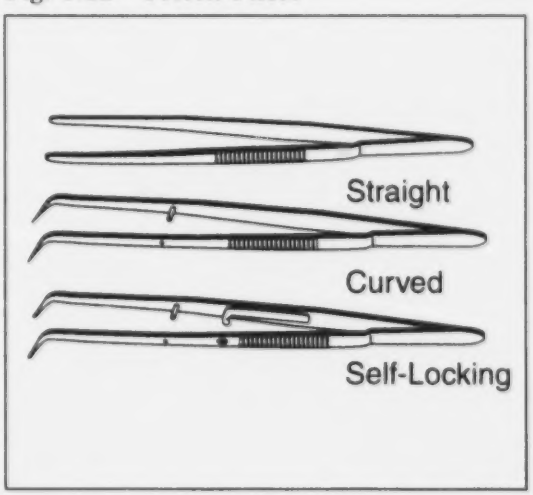
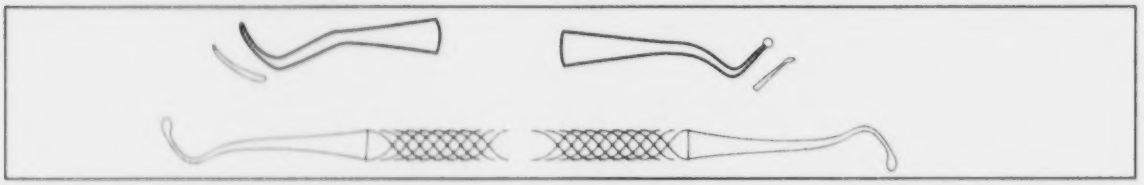


Fig. 5.13 - Spoon Excavator



Amalgam Restoration

The silver **amalgam restoration** is the most common restoration used in dentistry today. Amalgam is used as a restorative material on all surfaces of posterior teeth. Most dental amalgam contains approximately 65 percent silver and is sometimes referred to as a "silver filling."

There are certain instruments and accessories specifically used for preparation of the amalgam restoration. They are assembled on a preset tray to facilitate setup and handling.

Tray setup - The sterile instruments are organized on the tray in the sequence of their use. It is important that the dental aide be familiar with these instruments so he/she can properly set up the operatory for the amalgam procedure.

Amalgam setup includes a spoon excavator, gingival margin trimmers, amalgam carrier, amalgam condenser, amalgam carvers, burnishers, matrix retainers and bands, the basic setup (mouth mirror, explorers, and cotton pliers), and miscellaneous items.

Spoon excavator - The spoon excavator has the basic shape of a household spoon, except that its margins are tapered and sharp. It is used to remove decay.

Gingival margin trimmers - These instruments are designed to bevel (trim) the gingival (gum line) margin of the cavity preparation. Margin trimmers come in a set - right and left, mesial and distal. Therefore, it requires two double-ended instruments to make a complete set.

Amalgam carrier - After the amalgam is mixed, it is transferred to the cavity

Fig. 5.14 - Gingival Margin Trimmers

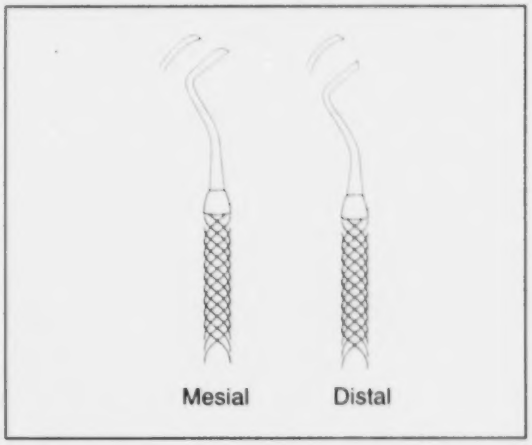


Fig. 5.15 - Amalgam Carriers

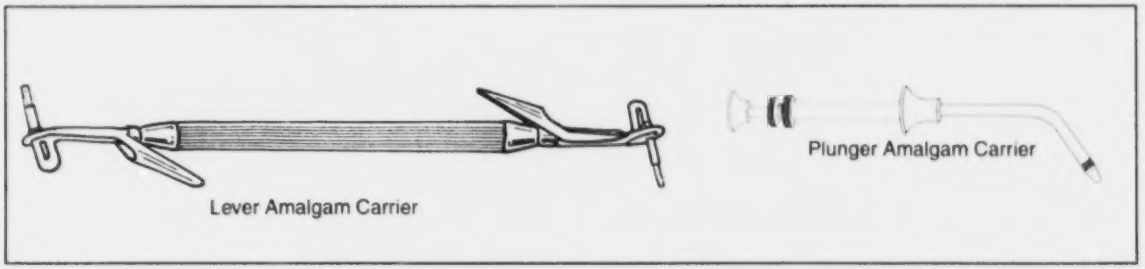
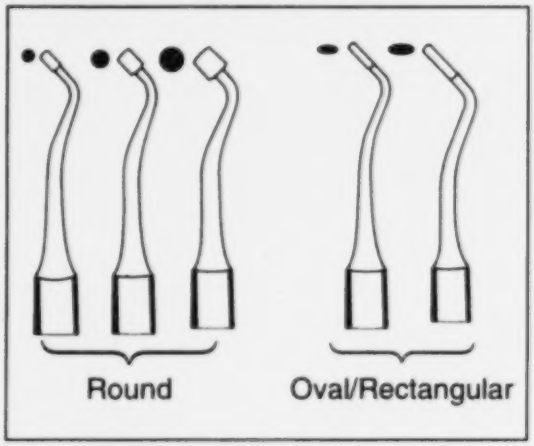


Fig. 5.16 - Amalgam Condensers



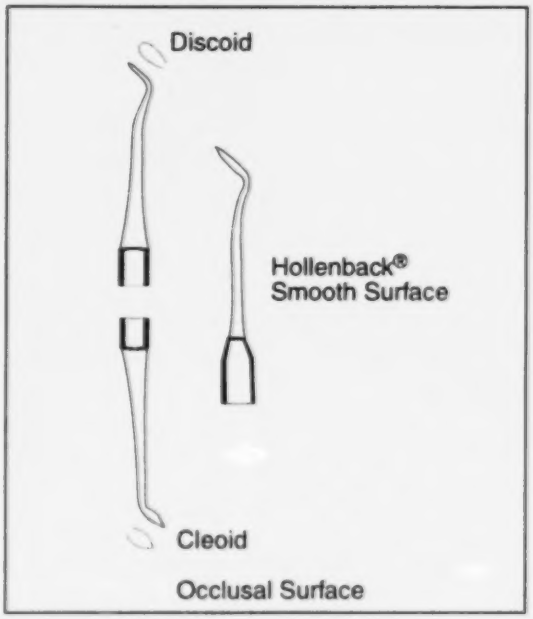
preparation with the amalgam carrier. The amalgam is forced into the hollow barrel and expelled into the cavity preparation. Amalgam carriers may be lever style or plunger style.

Amalgam condenser - After the amalgam is placed into the cavity preparation, it is compressed against the cavity walls and floors. The **amalgam condenser** is a small metal instrument with a flat surface that can be round or oval/rectangalar in design. The condenser is used for packing and condensing the amalgam.

Amalgam carvers - Amalgam carvers are used to create tooth anatomy on restorative material such as amalgam and to reduce the excessive material. The amalgam material is carved before it hardens. There are many styles of carvers on the market today, and every dentist has his/her favorite. Generally, carvers are divided into two categories: occlusal (biting surface) and smooth surface (buccal and lingual). Hollenback® and the discoid-cleoid are commonly used carvers (Figure 5.17).

Burnishers - **Burnishers** are used to smooth out rough edges of amalgam at the margins (edges) of the restorations. They are designed in several forms, including

Fig. 5.17 - Amalgam Carvers



round, football or egg, beaver tail, and anatomical. Besides smoothing a restoration, some burnishers, such as the anatomical burnisher, are also used to carve the anatomy in the restoration.

Matrix retainers and bands - When more than one side of a tooth needs to be filled, the dentist puts a metal band and holder around the tooth to keep the amalgam in place. One type of band is a Tofflemire® Matrix.

Fig. 5.18 - Burnishers

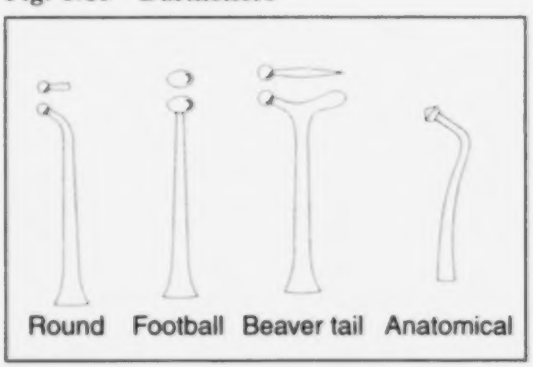
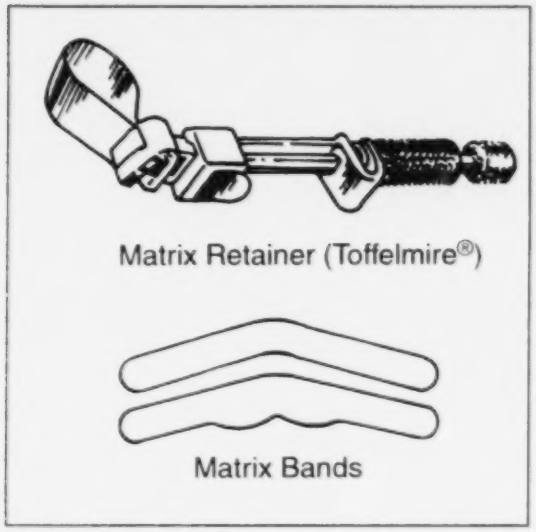


Fig. 5.19 - Matrix Retainer and Bands



The complete tray setup for amalgam restorations includes:

Basic setup (mouth mirror, explorer, and cotton pliers)
Spoon excavator
Gingival margin trimmer set
Amalgam carrier
Amalgam condenser
Amalgam carvers
- Discoid - Cleiod
- Hollenback

Burnishers
- Round
- Football or egg
- Beaver tail
- Anatomical

Matrix retainers and bands
Miscellaneous items:
- Wedges
- Cotton rolls
- Gauze 2 X 2's
- Cotton pellets
- Articulating paper (carbon paper used to check the occlusion)
- Cotton tip applicators
- Dycal placing instrument (used to place insulating base material under fillings)

Composite Restoration

Composite restorations use a white filling material, commonly made of a type of plastic. **Composite restorations** are used for aesthetic purposes, that is, they are placed in anterior (front) teeth and other visible areas in the oral cavity. Some composite products rely on a chemical reaction to set. This paste system has a catalyst material and a base material and is sometimes referred to as an A-B paste system. Other composites are placed in a prepared cavity and harden or set by the use of a visible light.

Regardless of which material is selected for an aesthetic composite restoration, the same basic instruments are used with the exception of the specific equipment required to prepare and mix the material selected.

Tray setup - The complete tray setup for a composite restoration includes the basic setup (mouth mirror, explorer, and cotton pliers), spoon excavator, enamel chisel, hatchet, filling instrument, matrix strips, finishing materials, and miscellaneous items.

Spoon excavator - This is the same instrument used to remove decay for amalgam restorations (fillings). It is used in the same capacity for composite restorations.

Fig. 5.20 - Enamel Chisel

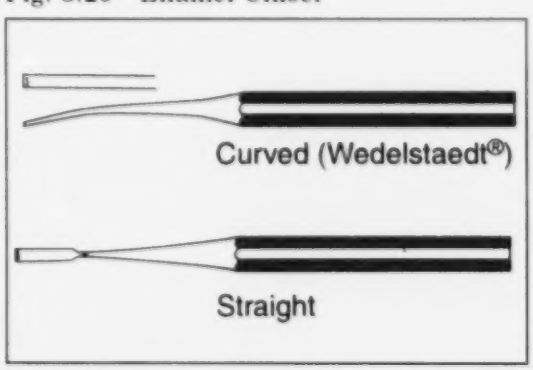


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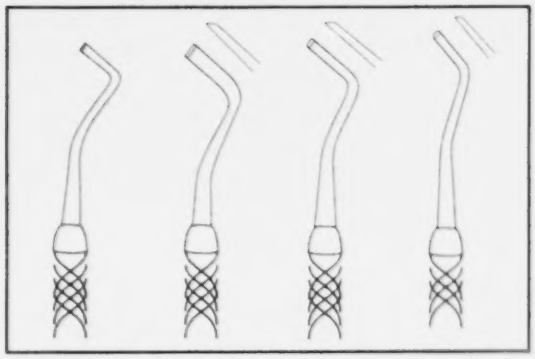
Fig. 5.21 - Hatchets



Enamel chisel - An enamel chisel is a sharp-bladed instrument designed to trim away excess enamel or dentin. It is used in a thrusting or pushing motion. Enamel chisels may be straight or curved. The Wedelstaedt® chisel is a commonly used style.

Hatchet - The hatchet is similar to a standard wood hatchet. Its blade is sharpened to form a vertical cutting edge. This instrument is used to cut grooves in the enamel or dentin. There are several different sizes of hatchets.

Filling instrument - The filling instrument is a plastic or Teflon®-tipped device used to place the composite material in the cavity preparation. The instrument is made of plastic or is Teflon®-tipped so the filling material does not stick to it and the instrument does not discolor the composite material. One end has a paddle-style tip and the other has a round-plugger design. Some have paddles on both ends (Figure 5.22).

Fig. 5.22 - Filling Instruments

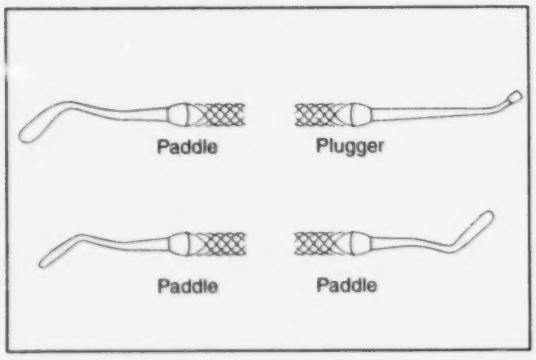
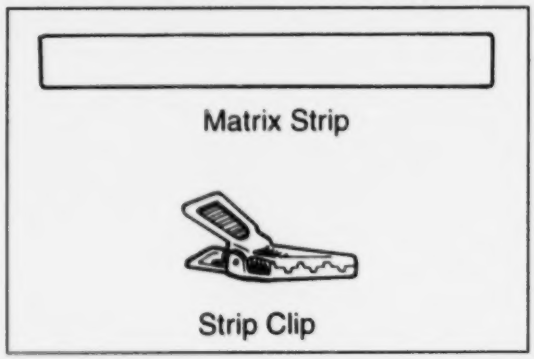


Fig. 5.23 - Matrix Strip and Strip Clip

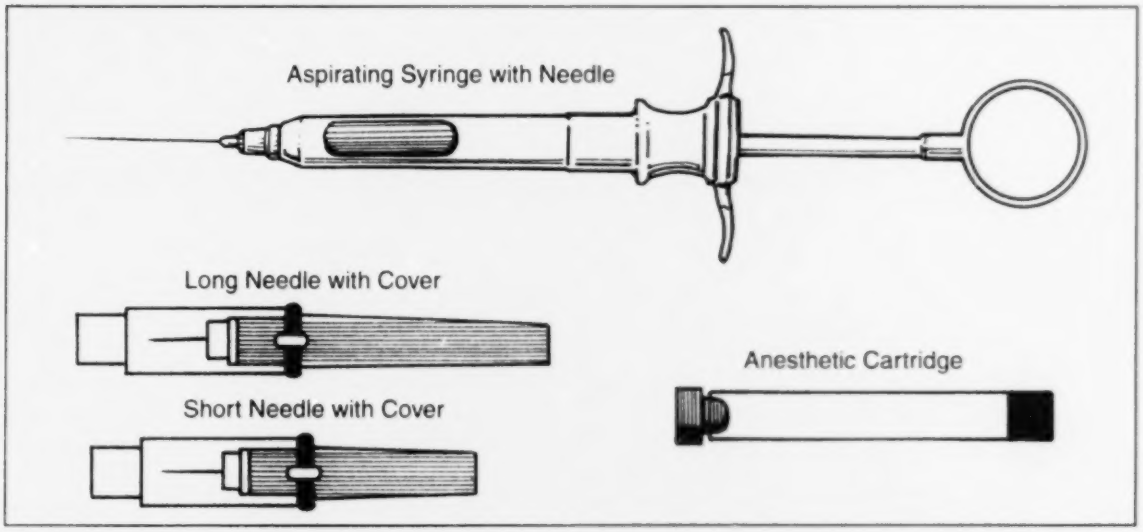


Matrix strips - Matrix strips serve to shape and form the interproximal (between) surfaces of the teeth to be filled. They also prevent the composite material from bonding to the adjacent tooth. Matrix strips are made of either clear plastic (Mylar®) or celluloid material. They may be held in place by a strip clip.

Finishing materials - After the composite material has cured or set, it is very hard. Trimming is accomplished with the use of a dental handpiece and sand paper strips. Additional diamond burs, sand paper discs, mounted stones, and rubber cups are used to trim and polish the composite restoration.

Basic setup (mirror, cotton pliers, explorer)
Spoon excavator
Enamel chisel
Hatchet
Filling instrument
Matrix strips and strip clip
Finishing materials
Miscellaneous items:
- Composite syringe
- Disposable brushes
- Shade guide
- Cotton rolls
- Cotton pellets

Fig. 5.24 - Anesthetic Setup



Dycal placing instrument (used to place insulating bases under fillings)
Polishing paste
Prophylaxis angle with rubber cup
Gauze sponge (2 x 2 inches)
Articulating paper (carbon paper used to check the occlusion "bite")
Cotton tip applicators

Local Anesthesia Setup

Most dental procedures involve the cutting or manipulation of tooth structure, which can be painful. Therefore, **local anesthesia** is used to relieve the sensation of pain for the dental patient. Local anesthesia is injected into the area where the procedure is to be performed. The area then feels numb or "asleep." A topical anesthetic is applied to the surface of the mucous membrane. A **topical anesthetic** reduces the discomfort of an injection at the puncture site.

A complete tray setup for local anesthesia includes an aspirating syringe, disposable needle, and anesthetic cartridge (Figure 5.24).

Aspirating syringe - The most commonly used syringe in dentistry is the aspirating metal syringe with a harpoon-type plunger. An **aspirating syringe** allows the dentist to determine if he/she is injecting the anesthetic solution in a blood vessel. Anesthetic should never be injected into the blood stream (Figure 5.25). The parts of a syringe include: a finger ring on one

Fig. 5.25 - Aspirating Syringe with Needle

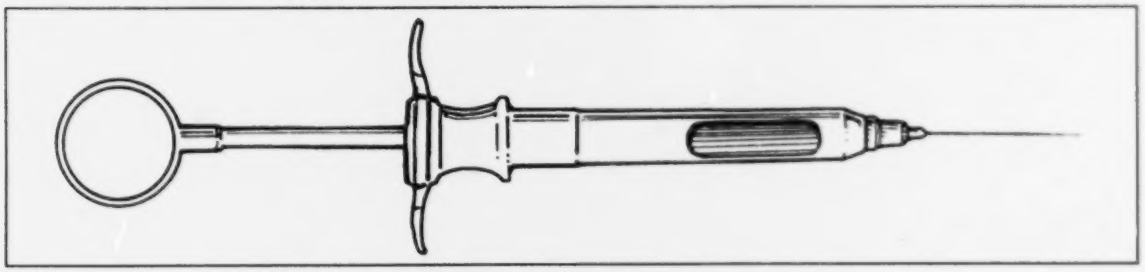
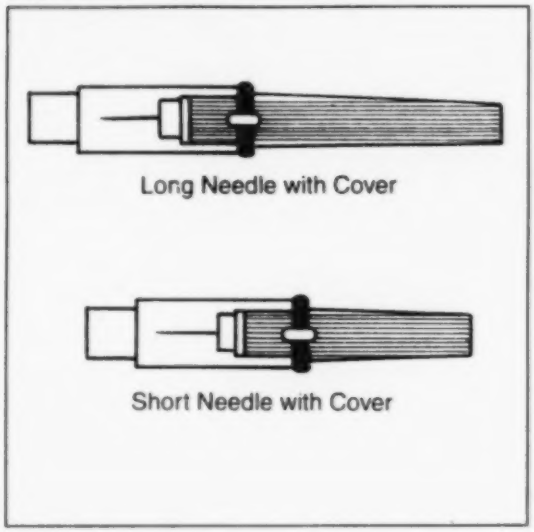


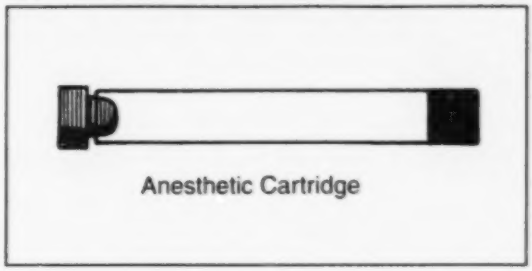
Fig. 5.26 - Disposable Needles



end, the barrel, and a threaded tip for the needle on the other end.

Disposable needle - Needles are available in different lengths and gauges. The most common lengths are the 1-inch short needle used for injecting teeth on the maxillary (upper) arch, and the 1 5/8-inch long needle used for injecting teeth on the mandibular (lower) arch. The common gauges are 23, 25, 27, and 30. The smaller the gauge number, the larger the diameter or thickness of the needle.

Fig. 5.27 - Anesthetic Cartridge



Anesthetic cartridge - Local anesthetic is supplied in a glass tube called a cartridge. One end of the cartridge has a rubber stopper. The other end has a aluminum cap with a rubber center into which the needle is inserted after it is loaded into the syringe. Most cartridges contain 1.8 ml of anesthetic solution.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

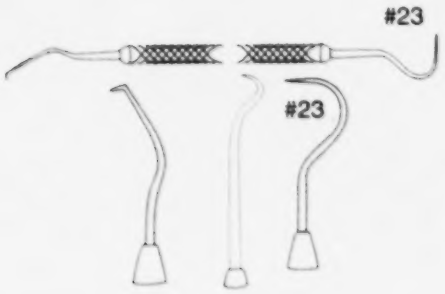
Lesson 3: Restorative Procedures

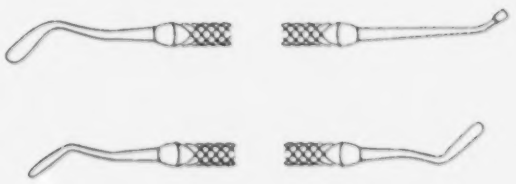
Activity Sheet

Student Name _____ Date _____

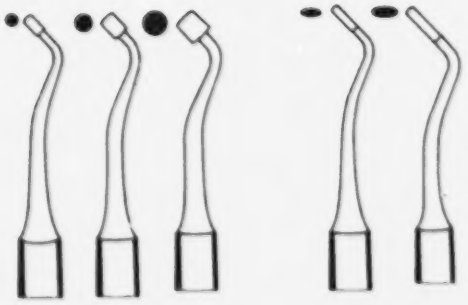
1. List the three (3) pieces of equipment which make up the basic setup.
   a. _____
   b. _____
   c. _____
2. List the nine (9) items which make up an amalgam restoration setup.
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____
   g. _____
   h. _____
   i. _____
3. List the eight (8) items which make up a composite restoration setup.
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____
   f. _____
   g. _____
   h. _____
4. List the three (3) items included in a local anesthesia setup.
   a. _____
   b. _____
   c. _____

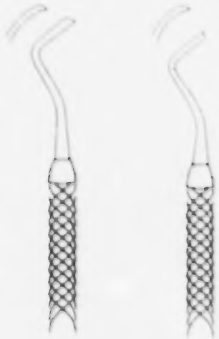
Identify the following instruments.





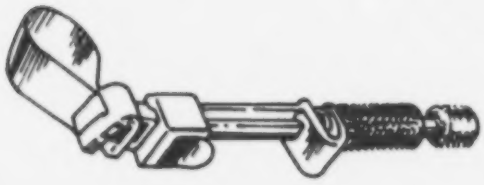
5. _____ 6. _____



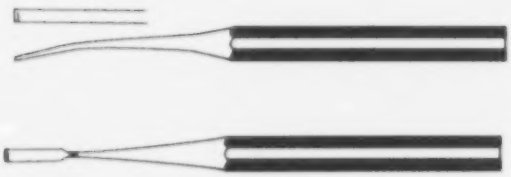


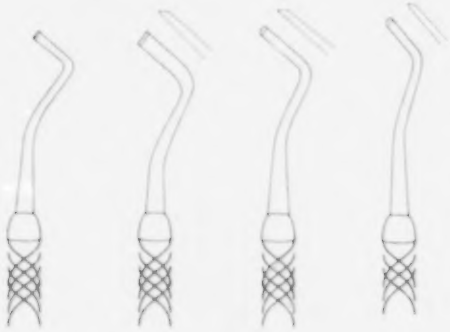
7. _____ 8. _____

Identify the following instruments.



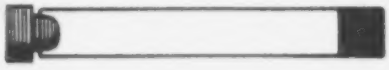
9. _____ 10. _____





11. _____ 12. _____

13. _____



14. _____

Clinical/Laboratory Activities

1. At your clinical site, practice preparing the tray setup for a basic setup, an amalgam restoration, a composite restoration, and local anesthesia. Ask your clinical supervisor to check your work.

Lesson 4: Surgical Procedures

Objectives:

A. List six reasons teeth may be extracted.

B. Identify the four instruments used in a forceps extraction and their functions.

C. Prepare the tray setup for a forceps extraction.

D. Identify the three instruments used for the placement of sutures.

E. Prepare the tray setup for placement of sutures.

F. Match key terms to their definitions.

Key Terms:

- Oral (ōr-ŭl) Surgery
- Extraction (ik-´strak-shŭn)
- Surgical Aspirator (ăs´pĭ-rā-tor) Tip
- Oral Evacuator (i-´vak-yū-wāt-ŭr)
- Periosteal (per´ē-os´tē-al) Elevator
- Elevator (´el-ū-vāt-ŭr)
- Luxate (lŭk-´sāt)
- Forceps (fōr-sŭps/-seps)
- Sutures (´soo-chŭrz)

Oral surgery is the area of dentistry dealing with the removal of teeth and surgical procedures on the oral tissues and the jaws. It specifically deals with:

- Removal of teeth
- Boney and soft tissue surgery
- Treatment of fractured jaws

Most general practitioners perform oral surgery procedures, but frequently they refer complex cases, such as fractured jaws and hospital cases, to an oral surgeon.

Extraction

Tooth removal, frequently referred to as an **extraction**, is the oldest and most commonly performed surgical procedure. Teeth may be extracted for the following reasons:

- Dental abscess.
- Advanced periodontal disease.
- Caries, where saving the tooth is not possible or acceptable to the patient.
- Part of orthodontic treatment.
- Impacted teeth, commonly affecting third molars (wisdom teeth).
- Failure of endodontic (root canal) treatment.

There are two methods used to remove teeth, the usual forceps method or by dissecting the tooth and surgically removing it from the socket. This second method applies to an impacted tooth or when fragments of the tooth are retained or buried in the jaw.

Tray setup for a forceps removal includes basic setup (mouth mirror, explorer, and cotton pliers), surgical aspirator tip, periosteal elevator, elevator, and forceps.

Surgical aspirator tip - The **surgical aspirator tip** is a specially designed **oral evacuator** (suction device). Its small tip opening gets down into the tooth socket to remove debris and clear the surgical site from bleeding (Figure 5.28).

Periosteal elevator - The **periosteal elevator** is a long pointed instrument. One end is spoon-shaped and the other is shaped to fit under the gingival tissue and detach it from the neck of the tooth. Performing this procedure prior to removing the tooth prevents unnecessary injury to the surrounding tissue (Figure 5.29).

Fig. 5.28 - Surgical Aspirator Tip

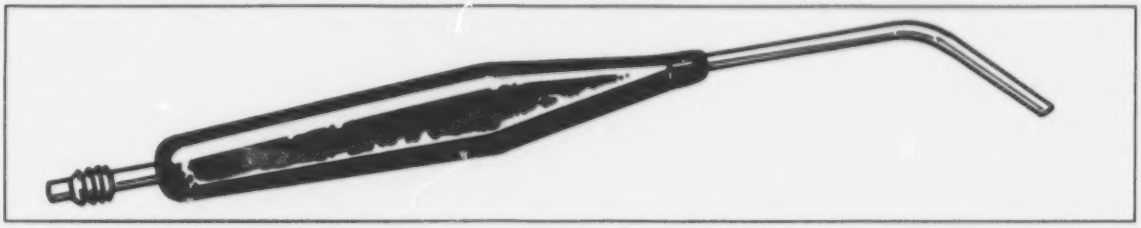


Fig. 5.29 - Periosteal Elevator

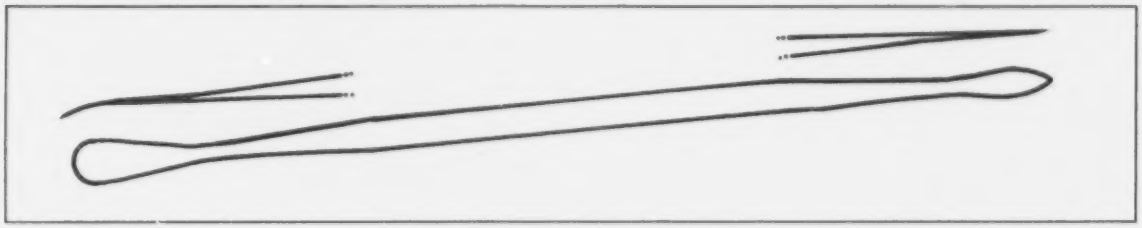


Fig. 5.30 - Elevator

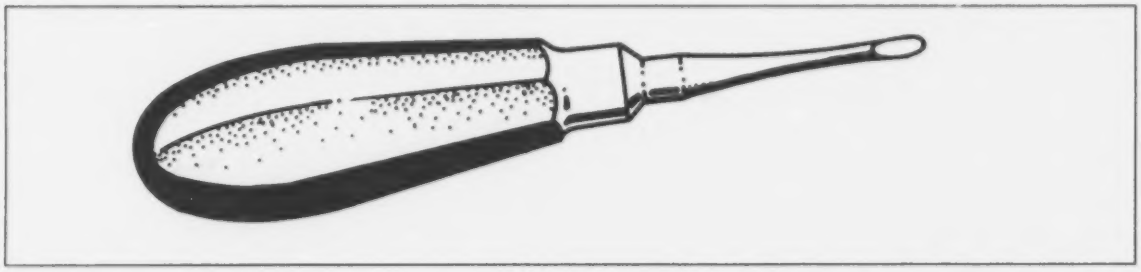
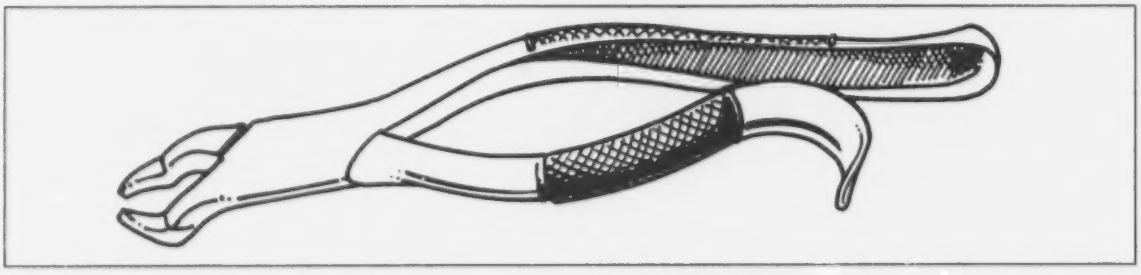


Fig. 5.31 - Forceps



Elevator - The **elevator** provides leverage to elevate or **luxate** (loosen) the tooth from its socket, thus making room for the forceps to facilitate teeth removal. There are many different types available, but most elevators come in sets of three, straight, right-curved, and left-curved (Figure 5.30).

Forceps - A **forceps** is used for the actual removal of the tooth from its socket, after it has been slightly loosened by the elevator. The beaks of the forceps are designed to fit the curve of the crown and onto the cementum so the tooth can be gripped for removal. There are many styles of extraction forceps because teeth vary in shape, size, location, and number of roots (Figure 5.31).

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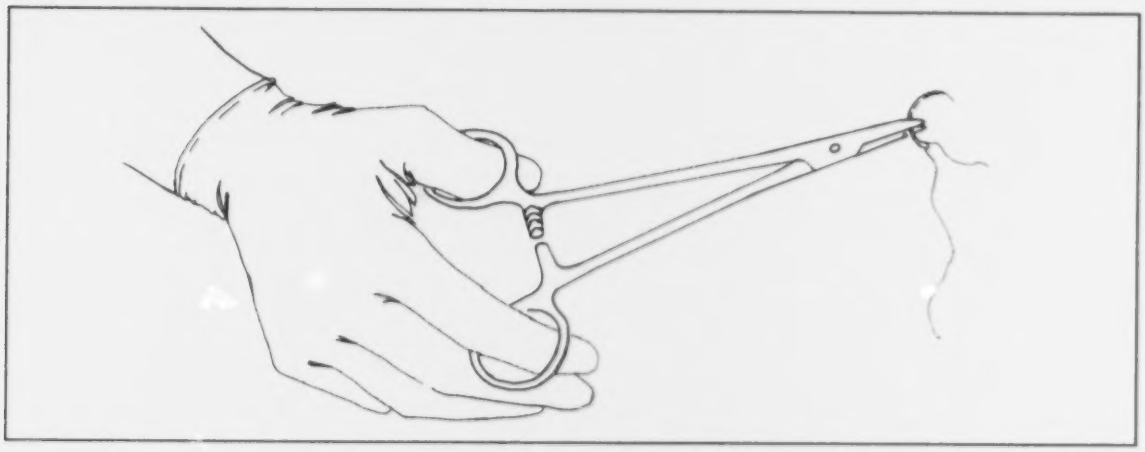
Fig. 5.32 - Suturing



Suturing

Once the operation area is cleaned of debris and excessive blood, the tissue is carefully placed back into position by inserting **sutures** (stitches). Not all surgical procedures require sutures, but they may be used to control bleeding, promote good healing, and restore normal tissue anatomy.

Suture setup includes basic setup (mouth mirror, explorer, and cotton pliers), scissors, needle holder, needle, and silk.

Scissors - Dental scissors are delicately designed instruments with curved tapered blades. They are used only to cut the suture silk.

Needle holder - The needle holder is a modified hemostat (pliers device) that has a smaller beak with distinct grooves. It provides space for the placement and retention of the suture needle (Figure 5.34).

Needle - Suture needles are curved with sharp points. They come in various sizes and curvatures. The curved needle allows the point to enter and leave the tissue in a small area. Most needles come in pre-threaded, disposable, sealed individual foil packets (Figure 5.35). These needles are sterile and ready for use.

Fig. 5.33 - Scissors

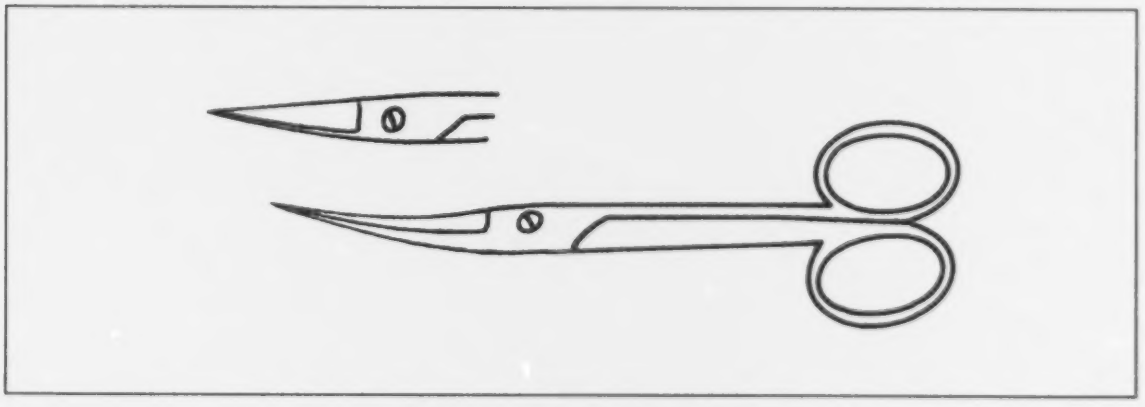


Fig. 5.34 - Needle Holder

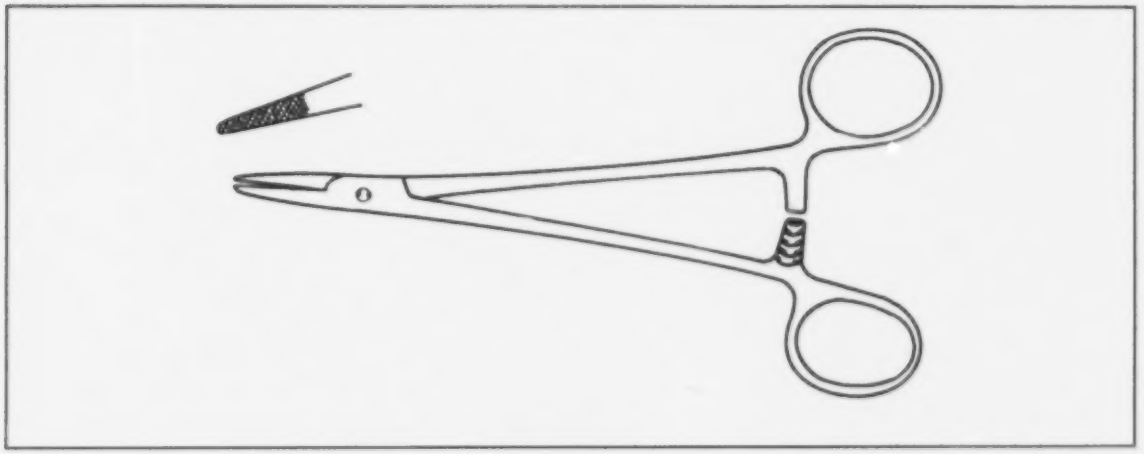


Fig. 5.35 - Prepackaged Suture and Silk

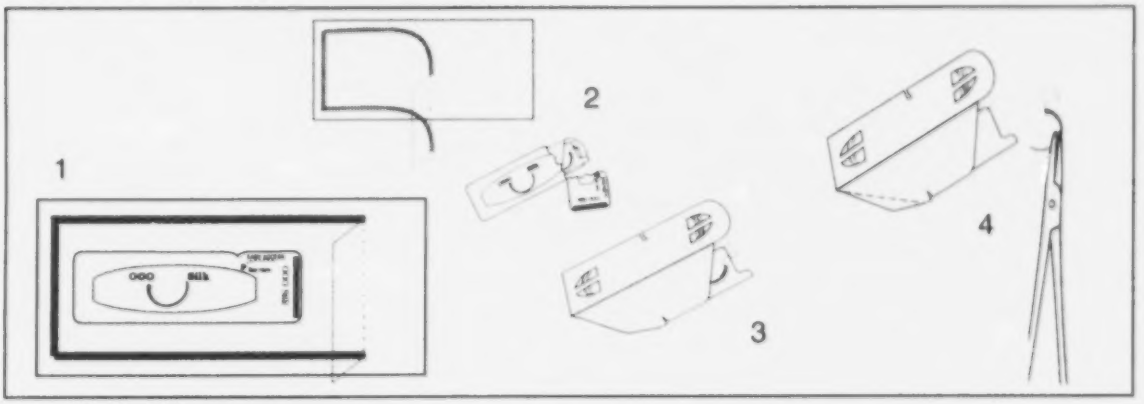


Fig. 5.36 - Needle and Suture Silk

Silk - Black braided silk is commonly used for suturing the oral cavity. The black color makes the silk readily visible. The suture silk should be removed in approximately seven days after the procedure. Suturing materials are made in a variety of thickness, which are described by an "O" (aught) rating. Triple aught (OOO) is most frequently used in the oral cavity.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written evaluation for this unit. A score of 80 percent indicates you have mastered this material and may proceed to the next unit. Check with your clinical supervising staff member for skill testing.

Lesson 4: Surgical Procedures

Activity Sheet

Student Name _____ Date _____

1. List six (6) reasons teeth may need to be extracted.

   a. _____

   b. _____

   c. _____

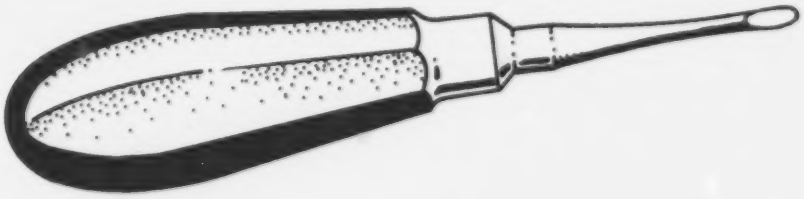
   d. _____

   e. _____

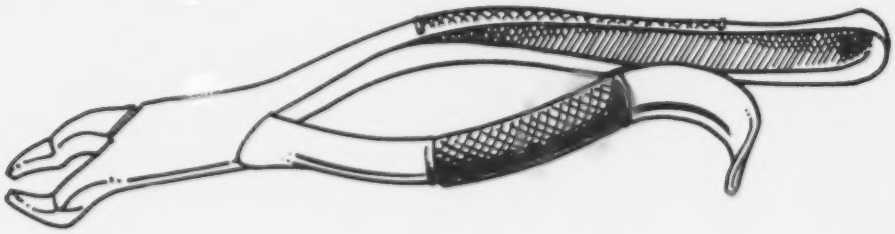
   f. _____

From the list below, identify the following pictured instruments.

Forceps	Periosteal elevator
Elevator	Needle and suture silk
Needle holder	



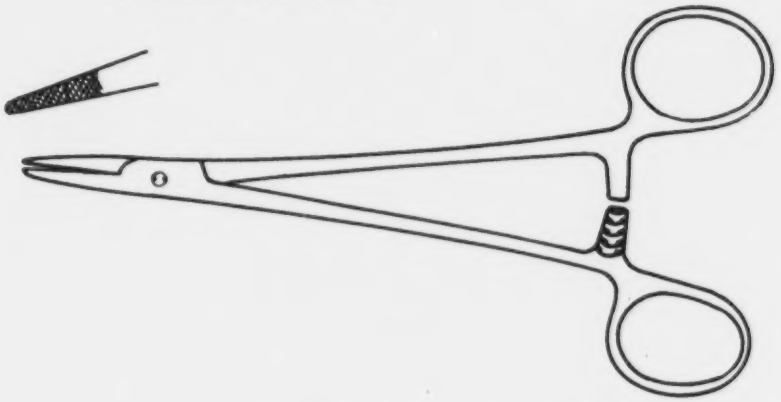
2. _____



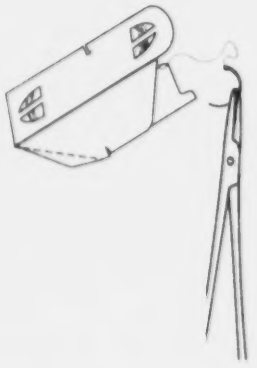
3. _____

From the list below identify the following pictured instruments.

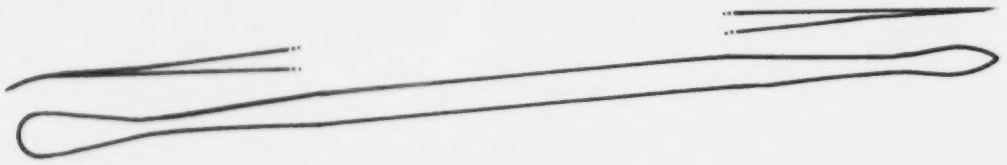
Forceps
Elevator
Needle holder
Periosteal elevator
Needle and suture silk



4. _____



5. _____



6. _____

Clinical/Laboratory Activities

1. At your clinical site, practice preparing the tray setup for a forceps extraction and for placement of sutures. Ask your clinical supervisor to check your work.

Operative Equipment, page 32

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Dental Operatory Rating _____

Comments: _____

_____

_____

Activity Sheet #2: Seating and Dismissal of Patients Rating _____

Comments: _____

_____

_____

Skill Sheet #1: Seat Patient Rating _____

Skill Sheet #2: Dismiss Patient Rating _____

Activity Sheet #3: Restorative Procedures Rating _____

Comments: _____

_____

_____

Activity Sheet #4: Surgical Procedures Rating _____

Comments: _____

_____

_____

Written Unit Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit VI

Dental Radiology

After completing this unit, you should be able to identify characteristics of radiation, along with the long-term and short-term effects of excessive exposure to radiation. Protection from ionizing radiation and infection control are essential. Using, processing, and mounting various types of radiographs will also be discussed.

Unit Lessons

Ionizing Radiation

Radiographic Films

Processing Radiographs

Mounting Radiographs

Infection Control

Lesson 1: Ionizing Radiation

Objectives:

A. Identify three unique characteristics of radiation.

B. Identify long-term and short-term effects of exposure to excessive ionizing radiation.

C. Match tissues discussed according to their sensitivity to radiation.

D. Identify the "Cardinal Rule" for protecting yourself from radiation exposure.

E. Identify the minimum standards to follow to protect yourself from excessive radiation when remaining in the x-ray room.

F. Match key terms with their definitions.

Key Terms:

- Electromagnetic (i-lek-trō-´mag-net-ik) Spectrum (spek-trŭm)
- X-rays (´eks-raz)
- Ionization
- Erythema (ĕr˜-ĭ-thē´mah)
- Tubehead (Toob-hed)
- Dosimeter (dō-´sim-ŭt-ūr)

Characteristics of Radiation

X-rays themselves are not unique. They are a part of an **electromagnetic spectrum** of wavelengths which allows them to penetrate tissue and produce a latent image on radiographic film (Figure 6.1). X-rays are imperceptible by any of our senses. **X-rays** are invisible and odorless, and can penetrate tissue without our knowledge, making them and their hazards easy to overlook.

Effects of Exposure to Ionizing Radiation

As members of the dental health team, dental aides will have access to areas where x-rays are taken. It is important that you are aware of the hazards of radiation and have an understanding why you should protect yourself from any sources of radiation. As a dental health team member, you are concerned with secondary radiation which is referred to as scatter radiation (Figure 6.2). When exposed to scatter radiation, ionization of cells occurs. **Ionization** produces

Fig. 6.1 - Electromagnetic Spectrum

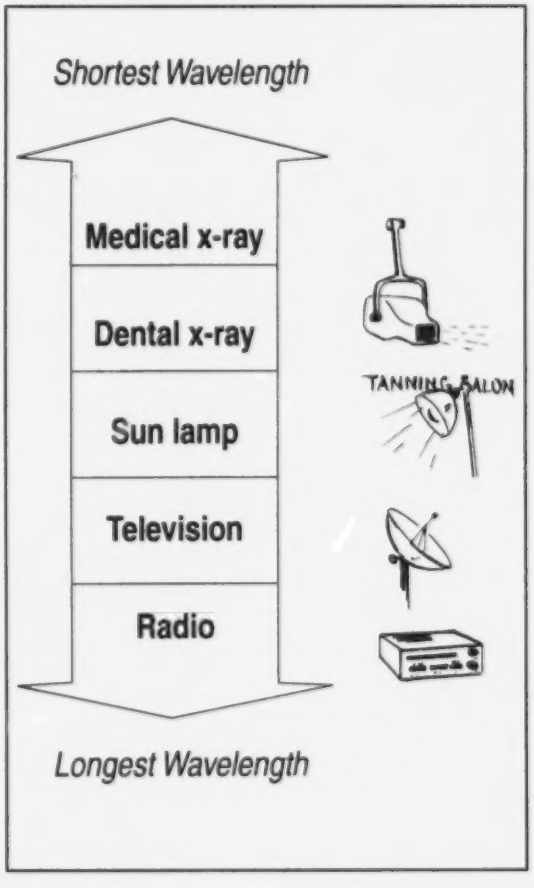
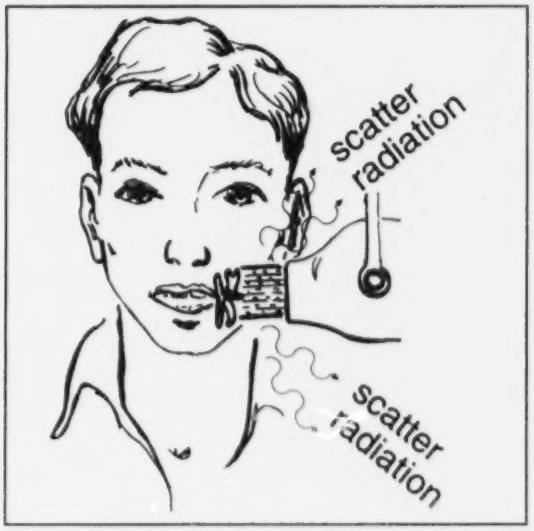


Fig. 6.2 - Scatter Radiation



biological changes in living tissue. These changes can be divided into two categories:

1. Long-term - Long-term effects of radiation manifest themselves years after the exposure. These delayed effects may be from acute exposure or a series of low-level exposures. Long-term effects of excessive radiation exposure include cancerous tumors, leukemia, cataracts, birth defects, and shortened life expectancy.

2. Short-term - Short-term or acute effects of radiation usually result from a high dose to the entire body. Symptoms may include nausea, vomiting, diarrhea, **erythema** (reddening of the skin), and hair loss.

Tissue Sensitivity to Radiation

Tissues vary according to their sensitivity to ionizing radiation. Thus, the amount of radiation required to produce damage varies according to the type of cell. Young, rapidly dividing cells are more radiosensitive than older cells. Figure 6.3 shows examples of cell sensitivity in descending order. A muscle, for example, is much less sensitive to radiation than the lens of the eye.

Fig. 6.3 - Tissue Sensitivity

a.	High	Lymphatic Tissue Bone Marrow Reproductive Cells
b.	Medium	Lens of Eye Skin Salivary Glands Mature Bone
c.	Low	Muscle Nerve

Methods of Protection from Ionizing Radiation

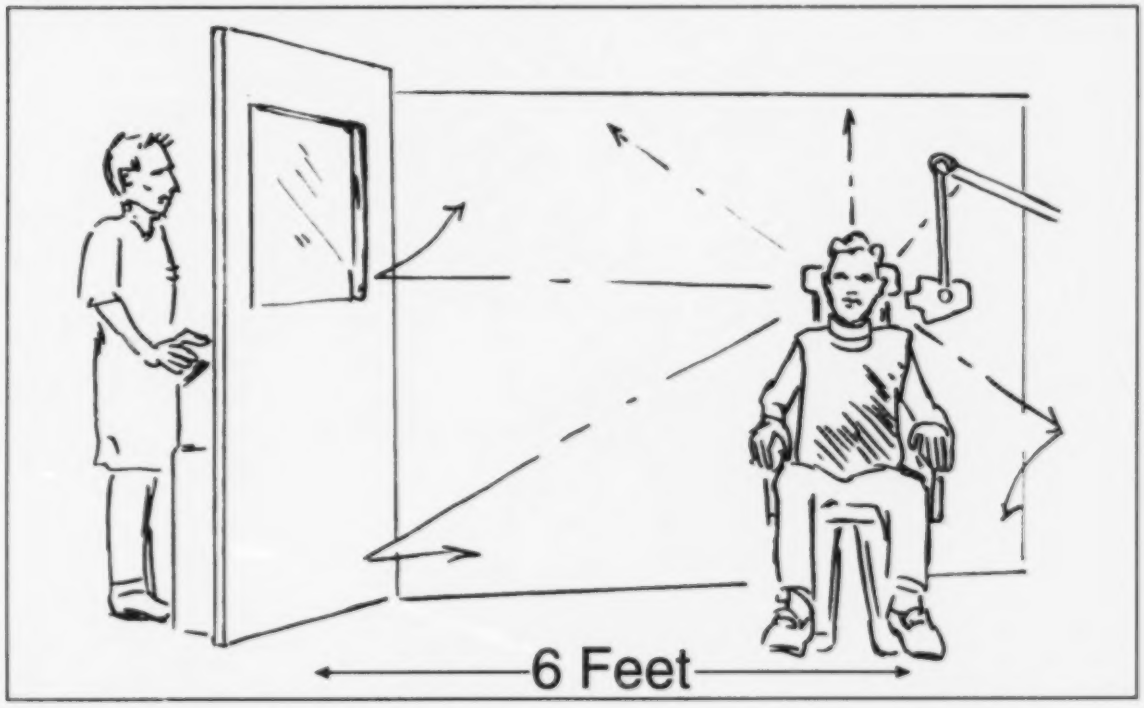
Since there are long-term and short-term effects of exposure to ionizing radiation, members of the dental health team must always protect themselves from excessive exposure to radiation.

The cardinal rule is: "Never stay in the same room while x-rays are being exposed." But if you cannot leave the room during an exposure, there are minimum standards to follow. Those standards are:

1. Position yourself a minimum of six feet from the x-ray **tubehead** (part of x-ray machine where radiation is actually produced, normally at the end of a flexible mechanical arm) during exposure.

2. Stand behind a lead-lined wall or shield (radiation cannot penetrate lead).

Fig. 6.4 - Proper Shielding and Positioning



3. Never hold the tubehead during exposure.

Monitoring how much radiation you are receiving at any given time is one way of determining your exposure. This is usually done by means of a **dosimeter** (monitoring badge). The badge is usually worn for about one month and then sent back to a company that specializes in monitoring radiation exposure. Remember, the badges are only methods of monitoring the amount of radiation exposure you receive and not a method that protects you from actual exposure of radiation.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Ionizing Radiation

Activity Sheet

Student Name _____ Date _____

Match the terms in Column A with definitions in Column B.

COLUMN A	COLUMN B
___ 1. Ionization	a. Part of the x-ray machine that aligns the beam to the object and film
___ 2. Tubehead	b. Group of invisible radiations whose properties are determined by their wavelength
___ 3. Electromagnetic spectrum	c. Produces biological changes in living tissue

4. List three properties of radiation.

   a. _____

   b. _____

   c. _____

5. Identify the following effects of excessive radiation by writing "S" if it is short-term or "L" if it is long-term.

   ___ Erythema ___ Birth defects

   ___ Cataracts ___ Cancerous tumors

   ___ Hair loss ___ Leukemia

   ___ Nausea ___ Diarrhea

6. Label the following tissues in their order of sensitivity. Use "H" for high sensitivity, "M" for medium sensitivity, and "L" for low sensitivity.

   ___ Muscle ___ Bone marrow ___ Reproductive cells

   ___ Lens of the eye ___ Nerve ___ Lymphatic tissue

7. List three methods of protection from excessive radiation when you cannot leave the room.

   a. _____

   b. _____

   c. _____

8. What is the "cardinal rule" that should be followed to avoid excessive exposure to radiation?

   _____

   _____

Clinical/Laboratory Activities

1. At your clinical site, observe the dental assistant or dentist when radiographs are being taken. What precautions were taken to ensure the safety of the patient and the worker?

   _____

   _____

   _____

   _____

Lesson 2: Radiographic Films

Objectives:

A. Identify the major uses of periapical films.

B. Identify the projections of periapical films in a complete radiographic survey (CRS).

C. Identify the uses of bitewing films.

D. Identify the projections of bitewing films.

E. Identify the purposes of occlusal films.

F. Identify the extraoral films used in dentistry along with their diagnostic purposes.

G. Match key terms with their definitions.

Key Terms:

- Periapical (per˝ē-ā´pĭ-kal) Film
- Bitewing (bīt´wing) Film
- Occlusal (ŭ-´kloo-sŭl) Radiographs
- Supernumerary (soopŭr-´n(y)oo-mŭ-rer-ē)
- Intraoral (īn˝trah-or´al) Radiographs
- Extraoral (ĕkstrah-or´al) Radiographs
- Cephalometric (sĕf´ah-lō-mĕ´trĭk) Radiographs
- Panoramic (pan-ŭ-ram-ik) Radiographs

Uses of Periapical Films

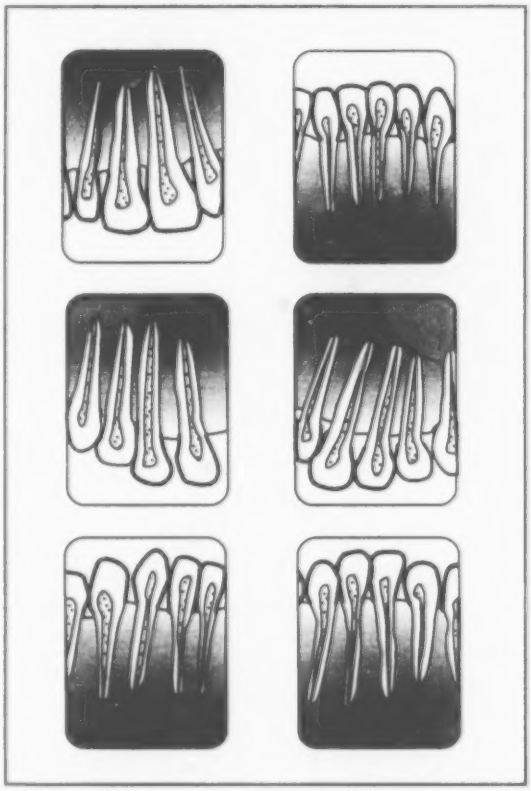
A **periapical** (around the root of the tooth) **film** shows the entire tooth from the occlusal (biting) edge to the apex (root tip), including 2 mm to 3 mm of surrounding bone. Periapical films are used to interpret normal healthy conditions or infections around the root area and in the surrounding bony structures.

Periapical Films in a Complete Radiographic Survey (CRS)

There are fourteen periapical film projections in a CRS. They include:

1. Two central lateral incisor projections:
   a. Maxillary incisors
   b. Mandibular incisors
2. Four cuspid projections:
   a. Maxillary right cuspid
   b. Mandibular right cuspid

Fig. 6.5 - Incisors and Cuspids

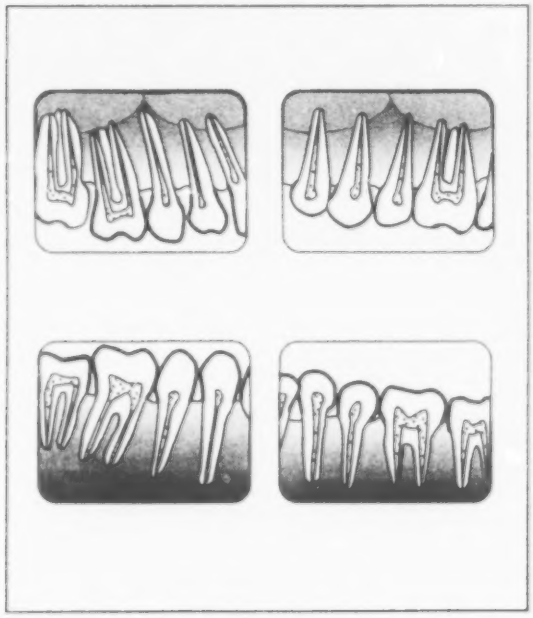


c. Maxillary left cuspid
d. Mandibular left cuspid

3. Four premolar projections:

a. Maxillary right 1st and 2nd premolars
b. Mandibular right 1st and 2nd premolars
c. Maxillary left 1st and 2nd premolars
d. Mandibular left 1st and 2nd premolars

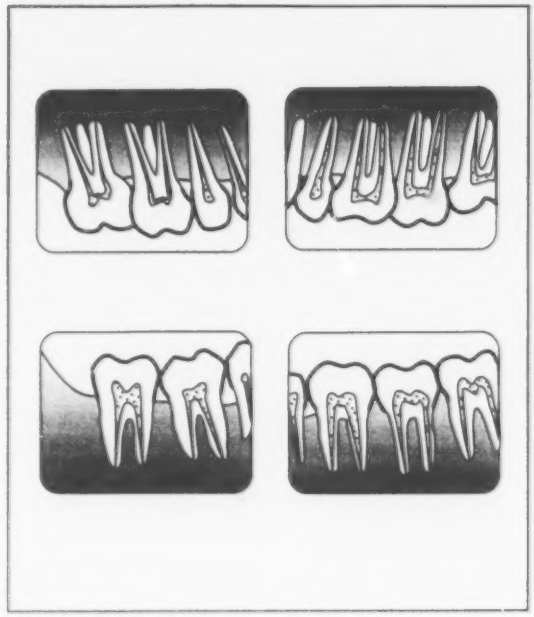
Fig. 6.6 - Premolar Projections



4. Four molar projections (Figure 6.7):

a. Maxillary right 1st and 2nd molars
b. Mandibular right 1st and 2nd molars
c. Maxillary left 1st and 2nd molars
d. Mandibular left 1st and 2nd molars

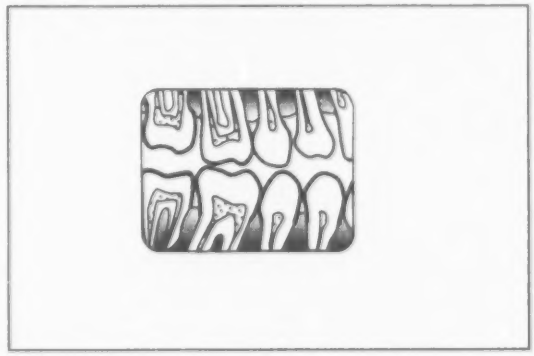
Fig. 6.7 - Molar Projections



Uses of Bitewing Films

The **bitewing film** records images of the crowns and interproximal surfaces of maxillary and mandibular teeth on the same film. It is a film, with a tab, that the patient bites down on to show half of the upper teeth and half of the lower teeth all at one time. It is used for detecting interproximal caries (decay), periodontal bone loss, decay under restorations, and calculus.

Fig. 6.8 - Bitewing Film



Projections in an Adult Bitewing Survey

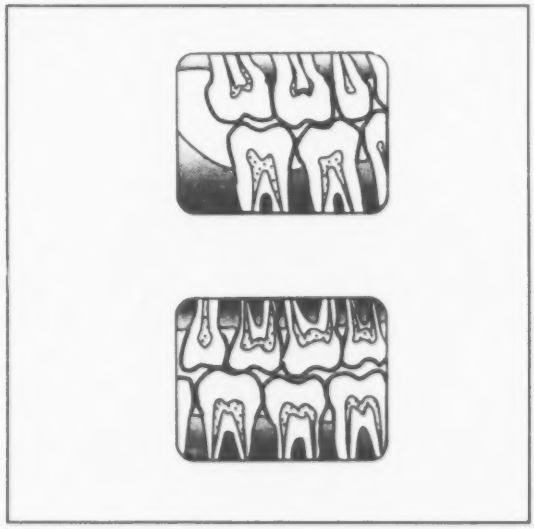
There are four bitewing film projections.

1. Two premolar projections (Figure 6.9):

    a. Right 1st and 2nd premolars
    b. Left 1st and 2nd premolars

Fig. 6.9 - Bitewing Premolars

Fig. 6.10 - Bitewing Molars



2. Two molar projections (Figure 6.10):

    a. Right 1st and 2nd molars
    b. Left 1st and 2nd molars

Occlusal Films

Occlusal radiographs show large segments of the maxilla or mandible. They can be used for adult patients who are unable to open their mouths wide enough for periapical films or for pediatric patients when other intraoral periapicals are difficult to obtain.

Occlusal radiographs are used in diagnosis of **supernumerary** (extra teeth), unerupted, and impacted teeth. They may be used to locate foreign bodies in the jaws, stones in the salivary glands, or the presence of cysts and tumors. There are two occlusal film projections.

1. Maxillary occlusal view.

2. Mandibular occlusal view.

Fig. 6.11 - Maxillary Occlusal View

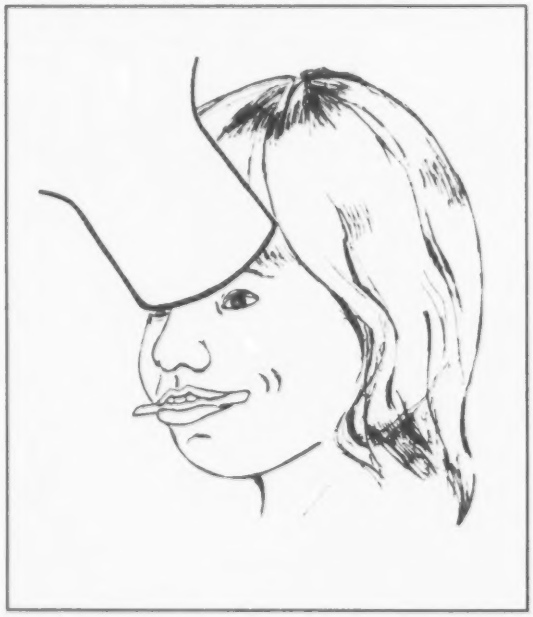


Fig. 6.12 - Mandibular Occlusal View

Fig. 6.13 - Cephalometric Radiograph

Extraoral Films

Making a diagnosis or assessing a patient's condition may require information that is not available on standard **intraoral** (inside the mouth) **radiographs**. **Extraoral radiographs** (outside the mouth), including cephalometric and panoramic, are taken when large areas of the jaw or skull need to be examined. Extraoral films are often used in conjunction with other radiographs.

A **cephalometric radiograph** is a 5 x 7 or 8 x 10 inch radiograph that shows the entire skull area. Orthodontists and oral surgeons use cephalometric radiographs for measuring facial growth and development, and for diagnosis of temporomandibular (jaw hinge or TMJ) joint conditions (Figure 6.13).

A **panoramic radiograph** is a 6 x 12 inch radiograph of the entire maxillary and mandibular arches (upper and lower jaws) in one exposure. It is most useful in orthodontics because it exhibits spacing of crowding of teeth and the growth pattern of both jaws. It is also useful for fractures, pathologic lesions, and the condition of the bone supporting the teeth (Figure 6.14).

Fig. 6.14 - Panoramic Radiograph

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 2: Radiographic Films

Activity Sheet

Student Name _____ Date _____

Match the radiographic film projection in Column B with its corresponding statement(s) in Column A.

COLUMN A	COLUMN B
____1. Used to detect interproximal decay.	a. Periapical
____2. A 6 x 12 inch radiograph exposed outside the mouth.	b. Bitewing
____3. Has 14 projections in a complete radiographic survey (CRS).	c. Occlusal
____4. Shows the entire maxillary and mandibular arch in one exposure.	d. Cephalometric
____5. Used to diagnose unerupted or impacted teeth.	e. Panoramic
____6. Shows the entire skull area in one exposure.	
____7. An 8 x 10 inch extraoral film.	
____8. Shows the entire tooth from occlusal edge to apex.	
____9. Intraoral radiographs that show large segments of the maxilla or mandible.	

Clinical/Laboratory Activities

1. After checking with your clinical supervisor, look at different types of radiographs used at the dental office.

Lesson 3:
Processing Radiographs

Objectives:

A. Prepare the darkroom for developing radiographs.

B. Process radiographs manually according to the steps of the procedure.

C. Process radiographs in an automatic processor according to the steps of the procedure.

D. Describe the advantages of automatic processors.

E. Identify appropriate infection control procedures when processing radiographs both manually and with a daylight processor.

Dental radiographs are the cornerstone of a complete oral diagnosis. No dental examination or treatment can be considered complete without current radiographs. Handling radiographs, whether processing (developing) or mounting them, is a very important procedure for any dental team member. No technique or operator expertise will overcome poor or lax performance in developing or mounting radiographs.

There are two types of radiographic film processing techniques, manual and automatic. Processing exposed x-ray film is a very precise procedure and many errors can occur if the procedure is not done properly. It is at this time the latent image is converted into a visible image. The darkroom is one of the areas in a dental office for which the dental auxiliary (employees other than the dentist) have complete responsibility. In addition to processing the film, you must keep the darkroom clean, change solutions regularly, and keep accurate records of radiographs. Errors in the darkroom can easily ruin what would otherwise have been good films, making it necessary to retake the films and increase radiation exposure to the patient.

Preparation of Radiographs for Manual Processing

Steps of Procedure for Preparing the Darkroom for Developing Radiographs:

1. Before processing begins, the darkroom should be checked to ensure the working area is clean, dry, and free of spilled solutions.

2. Turn on the tanks and adjust the water temperature to 68°F.

3. Check the solutions and add the proper replenisher/developer or fixer as required. By chemical reaction, replenisher/developer turns exposed film into images or x-ray pictures. Fixer stops the chemical reaction of the developing solution and "fixes" the image. Never add water to these solutions.

4. Stir the solutions. This is done to equalize the temperature and the chemical distribution of the solutions. Use a different stirring rod for each solution to prevent mixing.

5. Check the temperature of the solutions. Temperature should be approximately 68°F. If the temperature is incorrect, adjust the water bath by adding more hot or cold water and wait until the temperature stabilizes.

6. Determine the correct developing time from the manufacturer's chart, which should be posted in the darkroom, and set the timer. Do not activate the timer. Most manufacturers of manual processing solutions recommend developing film at 68°F for five minutes. If it is necessary to develop film at a different temperature, then the time should be adjusted accordingly. If the developer temperature is higher than 68°F, less developing time is needed. If the temperature of the developer is lower, more developing time is needed.

7. Mark the film hangers with the following information:

   a. patient's complete name
   b. date films were exposed
   c. number of films
   d. developer's initials

NOTE: New gloves should be donned before handling contaminated film packets in the darkroom.

Manual Processing

Steps of Procedure for Manually Processing Radiographs:

1. Prepare darkroom.

2. Lock the darkroom from the inside so no one can enter and expose the radiographs to white light, thus ruining them.

3. Turn on the safe light, and turn off the white light.

4. Put on gloves.

5. Open the film packets with gloved hands and allow the films to drop onto a disinfected counter or into a disposable cup without touching the film (see Figure 6.15). Films are not considered contaminated and should only be touched with clean hands.

Fig. 6.15 - Unwrapping Exposed Film

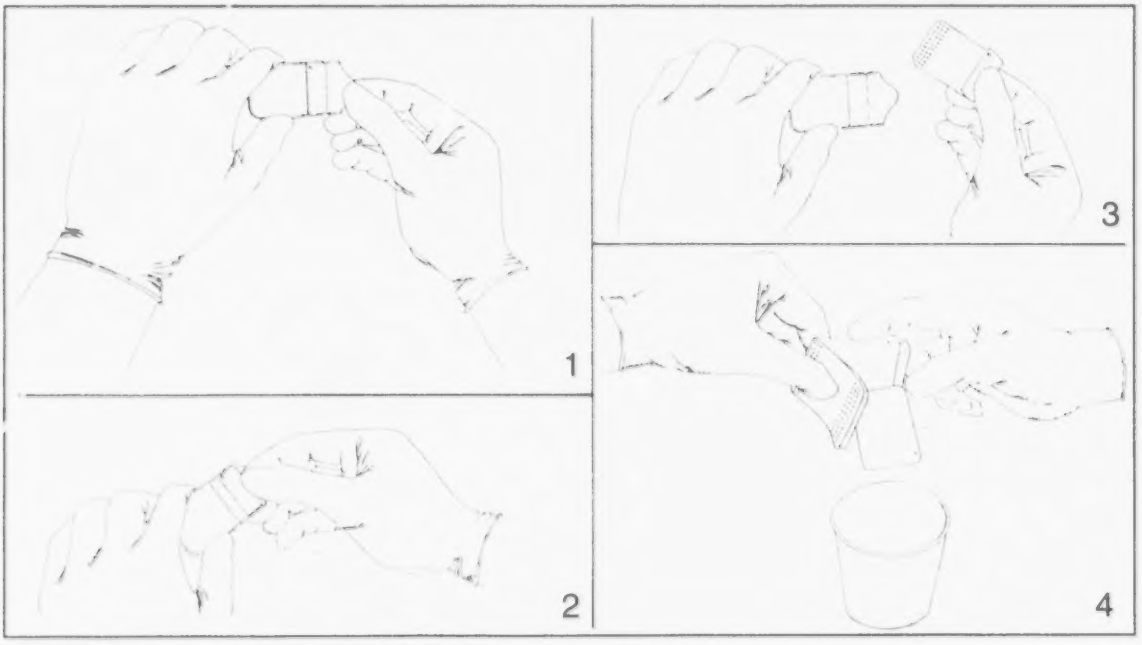


Fig. 6.16 - Load Film Hangers

6. Remove gloves and dispose of properly.

7. Load the film hangers (Figure 6.16). When all films have been attached to the rack, check to see they are secure.

8. Immerse the films in the developer and immediately raise and lower the hanger a few times to eliminate air bubbles on the films.

9. Activate the timer for the developing.

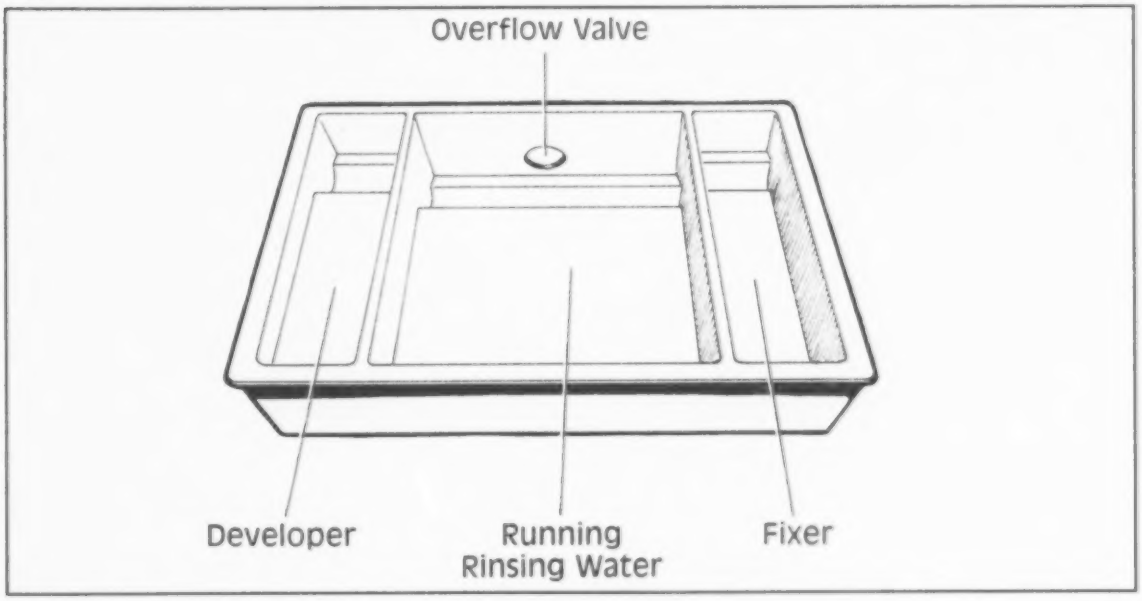
10. Cover the tanks and wait for the timer to go off.

11. Remove the film rack from the developer and rinse in running water for at least 15 to 20 seconds, while agitating the rack up and down.

12. When rinsing is complete, gently shake the rack to remove excess water and immerse films into the fixer for 10 minutes. Set and activate timer. Films may be viewed in 3 minutes, if the dentist requests a "wet reading." However, they must be returned to the film fixer to complete the 10-minute cycle to permanently set the image.

13. When fixing is complete, place the rack in the water tank and wash for at least 20 minutes in running water.

Fig. 6.17 - Film Processing Tank



14. Remove the films from the water tank and hang them to dry. Drying may be expedited by placing the films in a dryer. Once the films are thoroughly dry, they are ready to be mounted.

Automatic Processing

In recent years, the use of automatic film processing units has increased dramatically. Although most automatic processors process radiographs of high quality, they may break down. Therefore, most dental offices maintain a conventional manual processing darkroom as a backup to the automatic processor.

Most automatic processors are designed to carry film through the processor with rollers or tracks driven by either gears, belts, or chains (Figure 6.18).

Steps of Procedure for Processing Films in an Automatic Processor:

NOTE: If the automatic processor does not have a daylight loader, prepare in a darkroom. Enter the darkroom and open the film packets under safe lighting conditions. Insert them into the appropriate slots.

1. Complete the identification information on the mount:

   a. patient's complete name
   b. date films were exposed
   c. doctor's name

2. Put on gloves.

3. Remove contaminated plastic barrier packet and dispose of it properly.

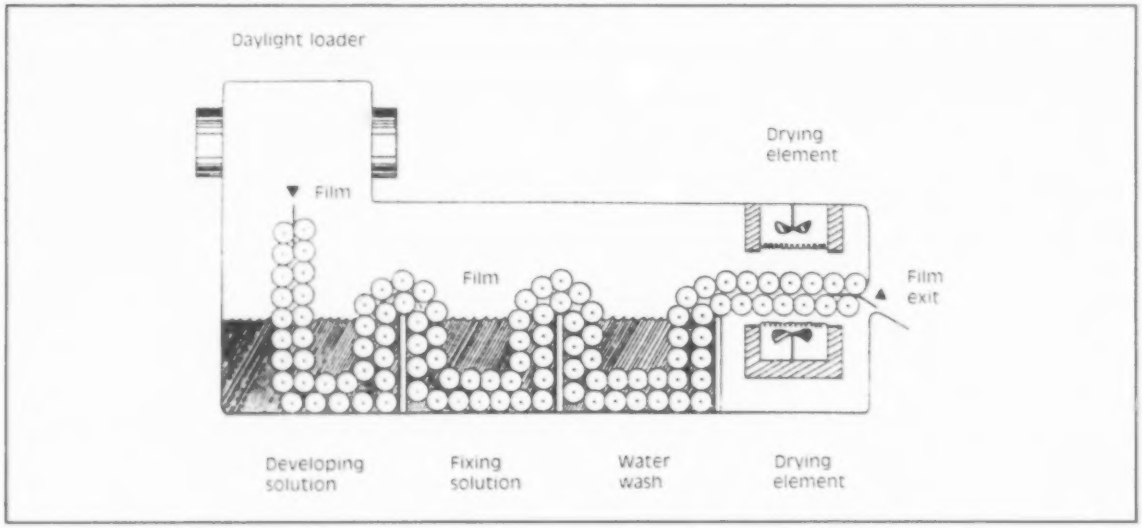
4. Remove gloves.

5. Place unopened exposed film packet into the side openings. Open the film packet inside the automatic processor and place the film in the receiving slot. Continue until all films have been inserted into the automatic processor.

5. Dispose of waste (black protective papers and lead foil) in appropriate containers.

6. Activate the processor.

Fig. 6.18 - Automatic Developer



7. At the end of the processing cycle (usually 4 to 7 minutes), the processed films will be delivered at the opposite end of the machine. They are dry and ready to be mounted.

Advantages of Automatic Processors

Manual processing for radiographs is gradually being replaced by the automatic processor for a number of reasons.

Automatic processors can shorten the processing time. They take from 4 to 7 minutes. Finished film is dry and ready to be mounted and placed in the patient's folder, reducing the chance for misplacing films.

Automatic processing equipment usually requires less space than manual processing equipment. Many automatic systems have a daylight loading system that does not require a darkroom.

The automatic processing cycle produces consistently good, standardized end results, if chemicals are properly maintained.

NOTE: A rigid maintenance schedule is required for all automatic processors. The rollers should be thoroughly cleaned each week. The solutions should be checked daily and replenished daily.

Infection Control During Film Development

Darkroom:

1. Put on clean gloves.
2. Open film packets and allow films to drop onto a disinfected counter or into a clean disposable cup without touching the film. The films are not considered contaminated.
3. Remove gloves and dispose of properly.
4. Continue the developing process.
5. Dispose of waste paper or plastic in proper container.

Daylight Processor:

1. Films should be pre-bagged in an additional plastic barrier packet. The exposure should be made with the film packet inside this plastic barrier packet. Gloves are to be worn at this time.
2. After exposing the film, remove the film from the pre-bagged barrier by allowing the film packet to drop on a clean paper towel or container. Caution should be taken not to contaminate the film packet.
3. Dispose the plastic barrier packets in the appropriate waste container.
4. Remove gloves and wash hands.
5. The film packets are not considered contaminated and may be placed into the daylight process hood without the use of gloves, or fear of contamination.
6. Daylight processor hoods should be disinfected at least once daily.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 3: Processing Radiographs

Activity Sheet

Student Name _____ Date _____

1. List the 7 steps of procedure necessary to prepare the darkroom prior to the developing process.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

   g. _____

2. Place an X in front of statements that are advantages of automatic processors.

   ____ Can have a "wet" reading after 3 minutes in the fix.

   ____ Time varies according to temperature of solutions.

   ____ Can be used without a darkroom.

   ____ Has a 10-12 minutes processing time.

   ____ Ready to put in patient's chart in 4 to 7 minutes.

   ____ Requires minimum space.

   ____ Standardized end results.

   ____ Solutions do not need to be replenished.

Clinical/Laboratory Activities

1. Ask your clinical supervisor to demonstrate the procedure for preparing the darkroom for developing radiographs, processing radiographs manually, and processing radiographs in an automatic processor. After the demonstrations, practice the procedures.

Lesson 4:
Mounting Radiographs

Objectives:

A. Mount in the correct position a **Complete Radiographic Survey (CRS)** of fourteen periapical and four bitewing radiographs.

B. Identify appropriate infection control procedures when mounting and viewing exposed radiographs.

Key Terms:

- Complete Radiographic Survey (CRS)
- Anatomic (ăn-ah-tŏm´ĭk) Relationship

Radiographs are mounted so they coincide with the teeth as you look at the patient's mouth. It is like putting a dental puzzle together, every film has only one position in the mount where it belongs. Because radiographs must be arranged in a proper **anatomic relationship** (where something fits according to structure and function), it is necessary for the person mounting the films to have basic knowledge of the anatomic structures of the oral cavity, including the teeth. Refer to Unit IV Basic Anatomy of the Oral Cavity, if necessary.

Types of Mounts

There is no one mount that satisfies all needs. The style and number of windows in the mount is dependent on the dentist's preference and the individual number of radiographs exposed on the patient. Most dentists use an 18-window mount for complete radiographic surveys and a 4-window mount for bitewing radiographs (Figure 6.19). Children require fewer radiographs than adults; therefore, a standard pediatric mount may contain from 8 to 12 windows (Figure 6.20). Notice the names of the teeth as they correspond to the various windows of the complete radiographic survey (Figure 6.21).

Fig. 6.19 - 4-Window Bitewing Mount

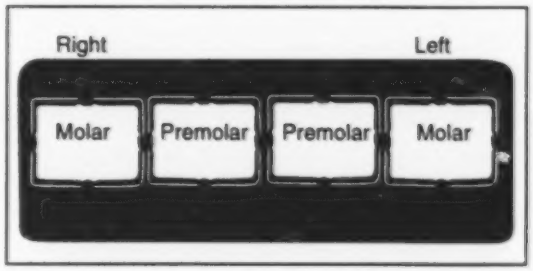
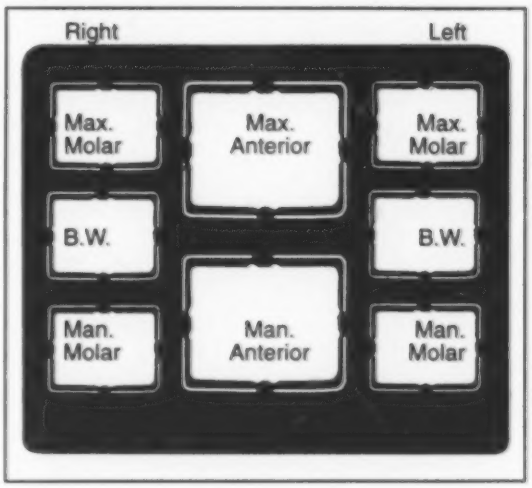


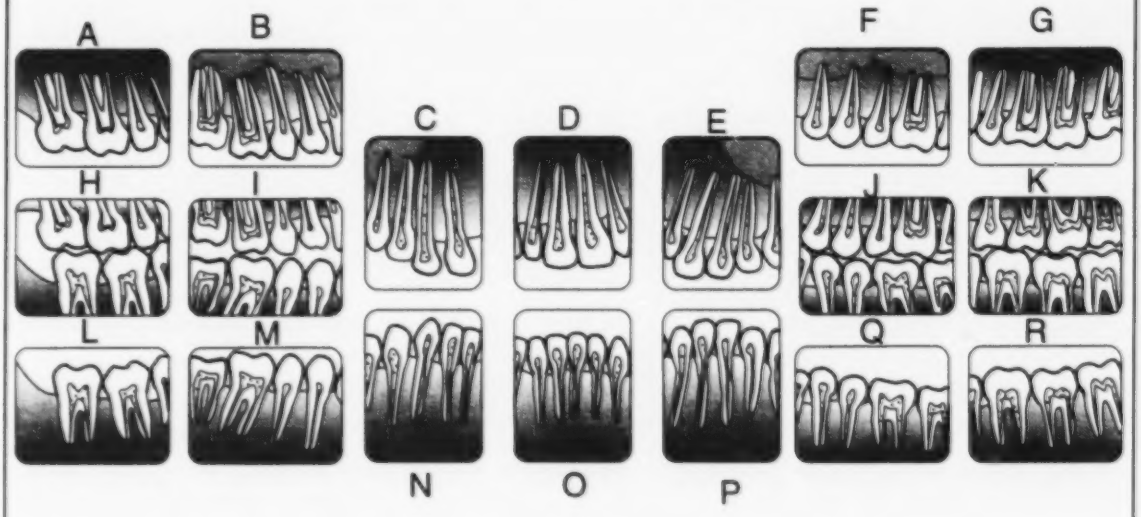
Fig. 6.20 - 8-Window Pediatric Mount



Steps of Procedure for Mounting a CRS

1. Collect films with a prepared mount and place them on a clean surface near the viewbox (a lighted box used to view radiographs during diagnostic evaluation and mounting).

Fig. 6.21 - Complete Radiographic Survey



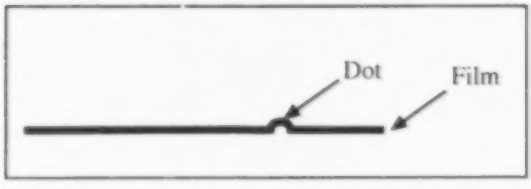
A. Maxillary Right Molar Area
B. Maxillary Right Premolar Area
C. Maxillary Right Cuspid Area
D. Maxillary Central Incisor Area
E. Maxillary Left Cuspid Area
F. Maxillary Left Premolar Area
G. Maxillary Left Molar Area
H. Right Molar Bitewing Area
I. Right Premolar Bitewing Area

Maxillary - Upper

J. Left Molar Bitewing Area
K. Left Premolar Bitewing Area
L. Mandibular Right Molar Area
M. Mandibular Right Premolar Area
N. Mandibular Right Cuspid Area
O. Mandibular Central Incisor Area
P. Mandibular Left Cuspid Area
Q. Mandibular Left Premolar Area
R. Mandibular Left Molar Area

Mandibular - Lower

Fig. 6.22 - Processed Radiograph



2. Turn all films so the embossed dot is raised (bump) toward you (Figure 6.22).

3. Divide films into three groups: maxillary, mandibular, and bitewings.

4. Select the four bitewing radiographs These radiographs show both the maxillary and mandibular teeth on one film.

5. Mount the two molar projections (pictures) in the two bitewing molar windows.

6. Mount the two premolar projections in the two premolar windows.

7. Select the film of the mandibular central incisor (these are the smallest teeth in the arch) and mount it in the lower central incisor window.

8. Select the film of the maxillary central incisor and mount it in the upper central incisor window.

9. Locate the four cuspid films. Separate the mandibular cuspids from the maxillary cuspids. The maxillary

cuspids are noted by the presence of the maxillary sinuses. Mount them in the four cuspid windows.

10. Select and sort out the two maxillary molar films, and mount them in the two maxillary molar windows. Remember, maxillary molars have three roots.

11. Select and sort out the two mandibular molar films, and mount them in the two mandibular molar windows.

12. The four premolar films are the only radiographs remaining. Place them into the mounts by matching them to the adjacent teeth, looking at the images of the cuspid and molar films. If in doubt, look for the maxillary sinuses on the maxillary premolar films.

13. Examine to see that all films are in order by matching bitewing landmarks, i.e. restorations, missing teeth. Check to see that all dots are in the raised embossed position. The overall curve of the occlusal/incisal edges should make the survey look as if it were smiling.

Helpful Hints:

- All anterior (front) teeth are vertical projections, and all posterior (back) and bitewing projections are horizontal.
- Mandibular anterior teeth have smaller crowns and shorter roots than maxillary anterior teeth. The four mandibular incisors usually fit on one film.
- Mandibular molars have only two roots, which makes them easy to identify. Maxillary molars have three roots.
- Most roots curve distally (away from center, toward the rear of the mouth).
- Maxillary radiographs have large dark or black areas on them. The nasal fossa (nose) in the anterior area and maxillary sinus in the posterior area cast a dark shadow on the radiograph, making it easier to determine maxillary film from the mandibular film.

Guidelines for Infection Control While Mounting and Viewing Exposed Radiographs:

- Prior to mounting radiographs, gloves must be removed and hands must be washed to remove powder.
- Charts, mounts, or radiographs should not be placed on counter tops that have been contaminated.
- When taking radiographs into the operatory, you should place them directly on the viewbox. Only remove them with clean hands, then place them into the patient's folder.
- Never allow radiographic films to become contaminated before or after mounting.
- If a set of mounted radiographs becomes contaminated, disinfect the set with an Environment Protection Agency (EPA) approved surface disinfectant that will not effect the image on the films.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 4: Mounting Radiographs

Activity Sheet

Student Name _____ Date _____

1. What are the three groups you should divide the films into before mounting them?

   a. _____

   b. _____

   c. _____

2. All anterior (front) teeth are _____ projections, and all posterior (back) teeth and bitewing teeth projections are _____ projections.

3. Mandibular molars have only _____ roots, and maxillary molars have_____ roots, which makes them easy to identify.

Clinical/Laboratory Activities

1. After checking with your clinical supervisor, look at different radiographs used in the clinical site. Practice mounting a complete radiographic survey. Ask your supervisor to check your work.

Lesson 5: Infection Control

Objectives:

A. Identify infection control barriers to be used by the dental personnel during dental radiography procedures.

B. Identify the parts of the x-ray machine which must have infection control barriers, along with the recommended disinfection material or barrier.

C. Identify the items which must be sterilized if used when exposing radiographs.

D. Match key terms with their definitions.

Key Terms:

- PID
- Thyroid (thī´roid) Collar
- Tuberculocidal (tŭ-bĕr´kūlō´sīdŭl)
- Virucidal (vī´rŭ-´sīdŭl)

Infection control has become a major concern in the practice of dentistry. Any infection control policy in dentistry must address procedures for radiology, including exposing radiographs chair side and processing radiographs in the darkroom. Infectious diseases can be transmitted by cross contamination of equipment, supplies, film packets, and cassettes used when exposing or developing radiographs. A complete health history should be obtained and carefully reviewed prior to performing any procedure on a patient, including exposing radiographs.

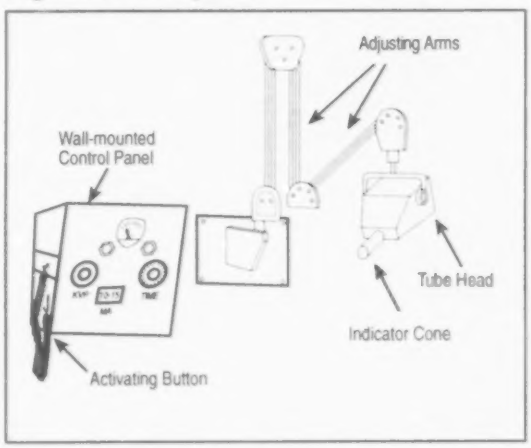
Barriers

Dental personnel should always wear gloves, mask, and protective eyewear when exposing radiographs on patients or handling contaminated radiographs.

Any object the operator touches after placing the film in the patient's mouth must be covered with a removable barrier or disinfected after the patient is dismissed.

Household plastic wrap, large plastic bags, or aluminum foil are good barriers to use on the **PID** (cone of the x-ray machine), the x-ray activation (patient exposure) button, the control panel, and the tubehead.

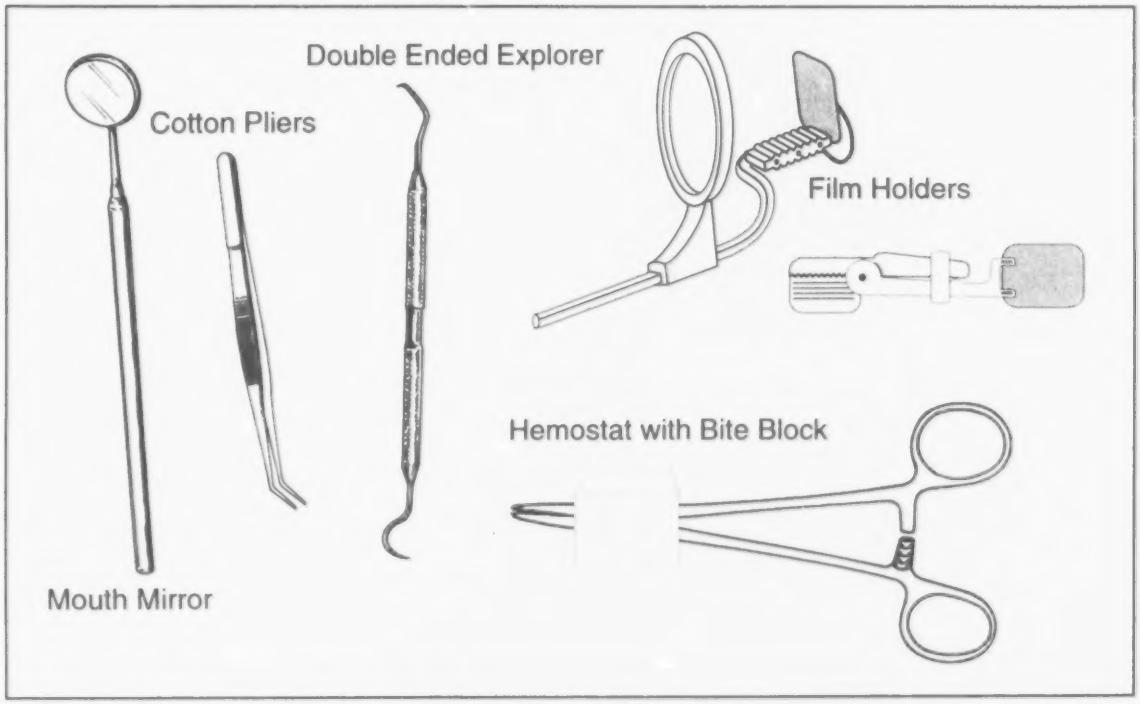
Fig. 6.23 - X-ray Machine



Disinfection and Sterilization

All work surfaces and radiographic equipment surfaces must be disinfected between patients. This includes not only the x-ray machine and counter tops but also the lead apron and **thyroid collar** (lead lined neck collar for the patient).

Fig. 6.24 - Radiographic Instruments



There are a variety of surface disinfectants recommended by various regulatory agencies. Always use an Environmental Protection Agency (EPA) registered surface disinfectant which is **tuberculocidal** (kills tuberculosis germs) and **virucidal** (kills virus). Some common surface disinfectants currently in use include iodophors, sodium hypochlorite, and glutaraldhyde (See Unit III, Infection Control for further explanation.). When using a surface disinfectant, follow the manufacturer's instructions in order to obtain optimum infection control.

After disinfecting all surfaces, set out instruments (film holders, film, and other materials) prior to beginning the radiographic procedure. This will reduce the possibility of cross contamination from opening drawers or cabinets.

All instruments, film holders, bite blocks, or sticks (Figure 6.24) that come in contact with the soft tissue must be sterilized prior to reuse. It is essential for all items that can be sterilized without causing damage to the item be sterilized, not just disinfected. If an item cannot be heat sterilized without damage, it must be submerged in an EPA approved sterilizing solution.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written evaluation for this unit. A score of 80 percent indicates you have mastered this material and may proceed to the next unit. Check with your clinical supervising staff member for skill testing.

Lesson 5: Infection Control

Activity Sheet

Student Name _____ Date _____

1. Identify three infection control barriers dental personnel should use when performing dental radiology procedures.

   a. _____

   b. _____

   c. _____

2. List the four parts of the x-ray machine that must have infection control barriers or be disinfected after use.

   a. _____ c. _____

   b. _____ d. _____

3. List three acceptable materials used for infection barriers on the x-ray machine.

   a. _____

   b. _____

   c. _____

4. List two items that must be sterilized after coming into contact with soft tissue of the mouth during radiographic procedures.

   a. _____ b. _____

Clinical/Laboratory Activities

1. At your clinical site, check out which parts of the x-ray machine have infection control barriers. List them below.

   _____

   _____

   _____

2. What surface disinfectants are used at your clinical site?

   _____

   _____

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Ionizing Radiation Rating _____
Comments: _____

_____

_____

Activity Sheet #2: Radiographic Films Rating _____
Comments: _____

_____

_____

Activity Sheet #3: Processing Radiographs Rating _____
Comments: _____

_____

_____

Skill Sheet #1: Prepare the Darkroom Rating _____

Skill Sheet #2: Manually Process Radiographs Rating _____

Skill Sheet #3: Process Films in an Automatic Processor Rating _____

Activity Sheet #4: Mounting Radiographs Rating _____
Comments: _____

_____

_____

Activity Sheet #5: Infection Control Rating _____
Comments: _____

_____

_____

Unit Written Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit VII

Basic Laboratory Procedures

The dental aide should be aware of the functions of lab equipment and safety precautions to be taken in the lab. The dental assistant may elect to teach the aide how to perform simple lab procedures. Familiarity with equipment and supplies used to perform these procedures will help the aide in learning new tasks.

Unit Lessons

Laboratory Safety and Cleanup

Basic Lab Equipment

Alginate Impressions

Lesson 1: Laboratory Safety and Cleanup

Objectives:

A. Identify general safety precautions to be taken in a dental lab.

B. Identify specific precautions to be taken around oxygen tanks.

C. Identify cleanup procedures to be followed in the lab.

D. Identify why inventory control is important in a dental office.

Key Term:

- Decontaminated

The dental aide can be very helpful in the lab if he/she respects the potential danger of lab equipment and does not attempt to perform lab procedures without hands-on training from the dental staff. This lesson will introduce you to hazards that may be posed by lab equipment and provide information on how the dental aide may be helpful in the lab.

General Lab Safety

Some lab equipment has moving parts that can cause injury to the dental staff. The dental aide should never operate lab equipment without hands-on training by the doctor or qualified staff members. For example, it is easy to brush your hands against the blade of the model trimmer or the bur on the lathe while they are running.

The dental aide should avoid wearing loose, flowing clothing, such as an extra big lab coat or apron, while in the vicinity of moving lab equipment. The loose clothing could catch on the moving parts and injure the aide. Some dental offices use equipment involving the use of an open flame. Loose clothing can pose a fire and injury hazard near these devices. It is necessary to wear personal protective equipment (PPE), such as a lab coat, while working on or near contaminated items, but it should fit comfortably without too much bulk.

Fig. 7.1 - Proper Protective Clothing

Hair longer than shoulder-length should be pulled back so it does not get caught in the moving parts of laboratory equipment or catch on fire near flames.

The aide should wear impact-resistant safety glasses when working on or near the model trimmer or lathe while they are running. Particles of plaster or acrylic can

fly off the blade or bur and cause serious eye injury.

Equipment should be turned off when not in use. Clothes could catch on moving parts, or motors may overheat and catch fire.

The dental aide must be trained in proper maintenance procedures used by individual offices before attempting to clean, repair, or maintain any equipment. Many items have sharp parts that could cut the aide or pose the risk of electrical shock if they get wet.

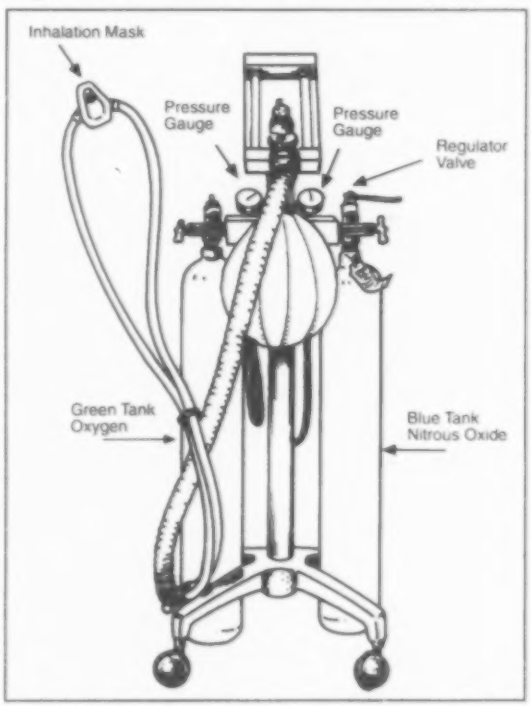
The dental aide will probably see special warning labels on some lab equipment. These labels mean the equipment poses a special hazard, and the aide should be trained by qualified staff members on how to approach such equipment.

Fig. 7.2 - Warning Labels

Special Precautions for Compressed Gas Tanks

Most dental offices have oxygen tanks, either for nitrous oxide (laughing gas) sedation or for medical emergencies.

Fig. 7.3 - Portable Nitrous Oxide Unit



Oxygen is a highly flammable gas; therefore, sparks or open flames should never come near the gas tank or patients who may be breathing nitrous oxide or pure oxygen. The flame or spark can make the oxygen explode.

The regulator valve on the oxygen tank controls how much compressed gas in the tank will be released at one time. If the regulator valve is removed or the tank is knocked over and the valve knocked off, the gas remaining in the oxygen tank will all escape at one time. The oxygen tank will then become an unguided missile

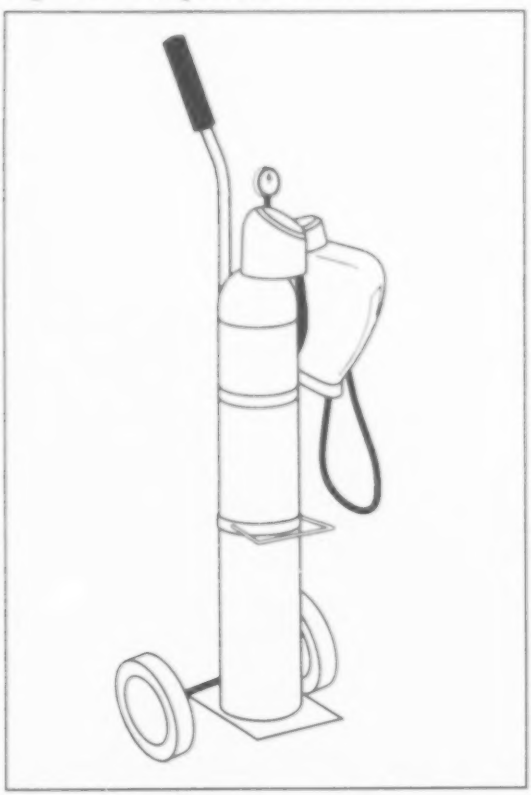
capable of penetrating walls, ceilings, and of course, people.

The dental aide should never attempt to oil the regulator valve or any other part of an oxygen tank. Any petroleum product, such as "3-in-1 oil" or petroleum jelly, will cause oxygen to explode on contact with the oil.

Some dental offices have compressed natural gas or propane tanks which may be used for heating or to fuel special gas torches used in some lab projects. The dental aide should never attempt to turn one of these tanks on or off, or adjust them in any way.

Not only are these gases highly flammable and explosive, inhaling natural gas or propane fumes for any period of time may cause death or brain damage.

Fig. 7.4 - Compressed Gas Tank



Laboratory Cleanup

Any impression, appliance, denture, or item that has come into contact with a patient's blood or saliva is contaminated. You will find that many contaminated articles are brought into the dental lab. These articles pose a threat of cross-contamination to the dental staff and other patients. Dental personnel following Universal Precautions treat all blood and certain body fluids as if they are carrying infectious and potentially fatal diseases. All contaminated items are treated with Universal Precautions.

Before working on a contaminated denture, appliance, or impression within the lab, these items must be **decontaminated** (cleaned and disinfected so that any potentially harmful germs are killed, removed, or inactivated). If a contaminated denture is polished, the equipment will transmit BOPIM (Blood or Other Potentially Infectious Materials) to the next denture that is polished, and so on. Since dentures are destroyed by heat, they cannot be heat sterilized.

Before an impression is poured in plaster or stone, it must first be decontaminated so that it does not transfer BOPIM to the cast. Impressions may be rinsed under running water, then sprayed with an EPA registered, hospital strength disinfectant and sealed in a plastic bag for the recommended period of time for disinfection. See Figure 7.5 on the next page. Dentures and appliances can be treated the same way prior to adjustment and polishing, except the sealed bag should be run through an ultrasonic cleaning cycle.

Contaminated items should never be allowed to come into direct contact with countertops or other lab surfaces prior to disinfection. If an item must be place on

Fig. 7.5 - Bagging Impressions

the countertop, a plastic barrier should be placed under it.

The lab should be cleaned after every use, so staff members who enter or use the lab later are not placing themselves or patients at risk for cross contamination. Although each dental office has its own procedure for laboratory cleanup, the procedure should include thorough cleaning of all surfaces prior to decontamination.

The dental aide and staff will always wear the proper personal protective equipment while working in the lab and cleaning/decontaminating after use of the lab.

The dental aide should always check paper towels, napkins, etc. to make sure an appliance or denture has not been wrapped in them before throwing the paper products out. Sometimes patients may bring their dentures into the office wrapped in a facial tissue. As they were brought in, these dentures may have been transferred to the lab. Also, some dental staff will dry a disinfected item in a towel and leave it there for adjustment as time allows.

The dental aide must never throw out an impression, cast, appliance, or any other lab product unless specifically told to do so by the doctor or qualified staff member.

Laboratory Inventory Control

If the dental aide is directed to obtain supplies from the storeroom, he/she should first check to see whether the office has an inventory control system. Some offices have a checklist that is marked every time an item is taken from storage. When the checklist shows there is only one particular inventory item left in storage, the staff member responsible for ordering supplies will order more of that item. An **inventory item** is any item or supply that can be used up and requires replacement when supplies of the item run low. If inventory items are not checked off this list, the office may run out of vital supplies.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 1: Laboratory Safety and Cleanup

Activity Sheet

Student Name _____ Date _____

1. List six (6) safety precautions the dental aide should observe within the lab.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

2. Describe the outcome of each of the following events.

   a. Sparks or flame come into contact with pure oxygen.

   _____

   b. The regulator valve is knocked off of the oxygen tank.

   _____

   c. Any petroleum product comes into contact with pure oxygen.

   _____

3. Describe the method used to decontaminate appliances and dentures.

   _____

   _____

4. Why is the lab cleaned after every use?

   _____

   _____

5. What might happen if supplies are taken out of the store room, but not checked off of the inventory control checklist?

   _____

   _____

Clinical/Laboratory Activities

1. Ask your clinical supervisor to show you where the nitrous oxide unit and oxygen tank are stored. Also, discuss safety precautions that must be followed when working in the laboratory.

Lesson 2: Basic Lab Equipment

Objectives:

A. Identify basic lab equipment and their functions.

B. Identify safety precautions to be taken when working around lab equipment.

C. Match key terms and their definitions.

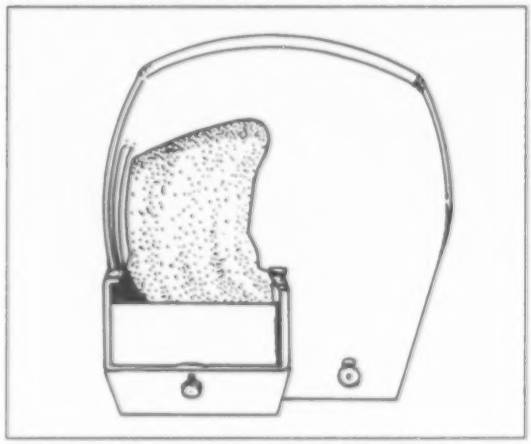
Key Terms:

- Cast
- Model
- Impression
- Model Trimmer
- Plaster Vibrator
- Motorized Lathe
- Bench Motor
- Acrylic
- Rag Wheel
- Pumice (pūm´īs)
- Nitrous (´nī-trūs) Oxide (ōk-sīd) Unit
- Regulator Valve
- Air Compressor
- Suction Machine

Model Trimmer

The model trimmer is used to trim away excess plaster from **casts** or **models** of a patient's teeth. A model or cast of the patient's oral cavity is a reproduction of the teeth and surrounding structures made from plaster or stone. An **impression** is a sort of "mold" of the patient's mouth. You will learn more about impressions later in this unit. Models or casts are obtained by taking an impression of a dental arch, then mixing plaster or stone powder with water and pouring it into the impression. Once the mix of plaster or stone hardens, the cast can be removed from the impression and trimmed on the model trimmer.

Fig. 7.6 - Model Trimmer



The **model trimmer** has a platform that the cast rests on during trimming. A very rough-surfaced metal blade rotates inside the model trimmer. When the model is pressed against the rotating blade, plaster or stone is trimmed away. The model trimmer must never be used without turning on the water valve that keeps the blade free of plaster or stone buildup. The blade of the model trimmer can severely damage

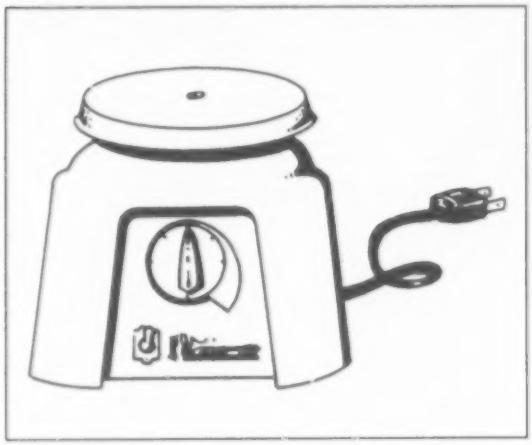
Fig. 7.7 - Cast Being Trimmed

fingers and hands; therefore, the dental aide should never attempt to use the model trimmer without careful training by the dental staff.

Plaster Vibrator

The plaster vibrator is used to remove trapped air from a bowl of plaster or stone during mixing and to help plaster and stone flow through the impression without trapping air while pouring the impression. The platform on top of the vibrator vibrates when the unit is turned on, which forces air to the top of the plaster or stone mix. Most vibrators have an adjustable speed control. It is a good idea to cover the vibrator with a paper towel while pouring impressions, because hardened plaster and stone are very difficult to clean. Over time, the buildup that occurs can interfere with the function of the unit.

Fig. 7.8 - Plaster Vibrator



Motorized Lathe

Another name for the motorized lathe is the **bench motor** (Figure 7.9). This device has two functions: to trim orthodontic appliances and dentures and to polish the **acrylic** (plastic) parts of such items. A typical lathe will have an acrylic bur attached to one end and a rag wheel attached to the other end. An acrylic bur is a special large bur designed to trim the plastic parts off appliances and dentures (Figure 7.10). A **rag wheel** is a soft wheel made of cotton that can be used with pumice to polish the plastic parts of appliances and dentures (Figure 7.11). **Pumice** is an abrasive substance that can put a smooth finish on the plastics used in dental appliances. The dental aide should not attempt to use the lathe without proper training.

Fig. 7.9 - Motorized Lathe

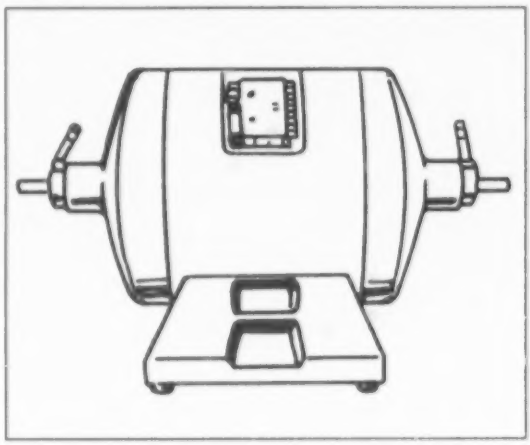


Fig. 7.10 - Acrylic Burs

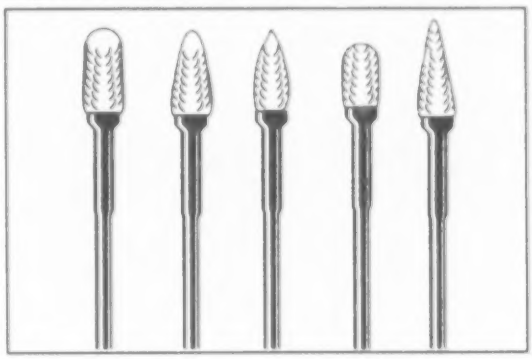
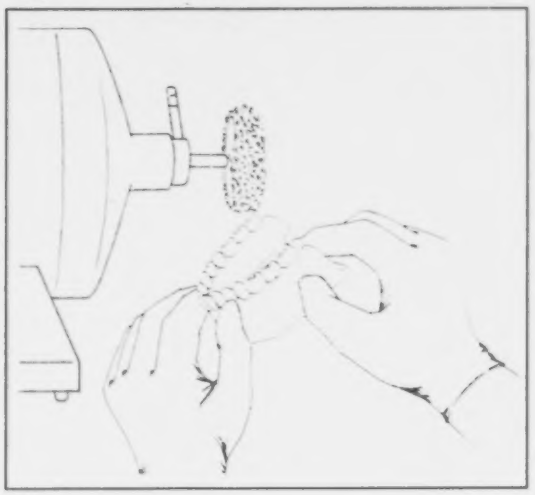


Fig. 7.11 - Rag Wheel



Portable Nitrous Oxide Unit

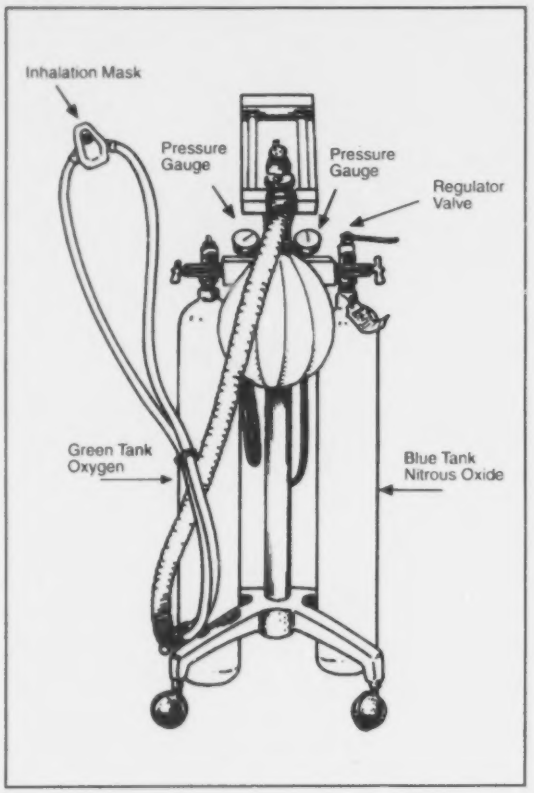
Nitrous oxide combined with oxygen is a gas that is used in dentistry to calm patients and lessen their pain perception.

The dental aide will not be responsible for placing patients on nitrous oxide, but the aide may be required to turn the tanks on and off.

The nitrous oxide tank is always blue, and the oxygen tank is always green. The top of each tank has a **regulator valve** that controls how much gas is released from the tank at one time and a pressure gauge that indicates how much gas is left in the tank.

The tanks are turned on by turning the regulator valve to the right only until the pressure on the pressure gauge begins to rise. They are turned off by turning the valve to the left until it will not turn any further. The dental aide should not touch the flow meter because that controls how much gas the patient receives, and only qualified staff members can make those decisions.

Fig. 7.12 - Portable Nitrous Oxide Unit



Compressor/Suction Switches

The handpieces and 3-way syringes on dental units are run by the release of compressed air. Each dental office has an air compressing machine (**air compressor**), that must be turned on in the morning and off when leaving the office at the end of the day. Compressed air cannot provide suction for the oral evacuator, so the office will also have a **suction machine**. This unit must also be turned on in the morning and off when leaving for the day. If either of these machines is left on overnight, its motor may overheat, destroying the machine. The dental office would be unable to treat patients until the machines were repaired or replaced.

Equipment Maintenance

Except for the compressor and suction machines, equipment in the lab should be turned off when not in use. The dental aide should never attempt to repair broken equipment. Equipment should be kept clean according to the office routine, and the aide should not vary from that routine. If water contacts certain electrical equipment, the aide runs the risk of receiving electrical shock and causing the equipment to short out.

Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

Lesson 2: Basic Lab Equipment

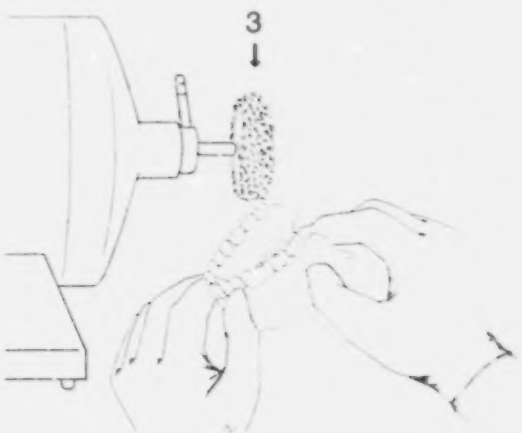
Activity Sheet

Student Name _____ Date _____

Identify the lab equipment on the lines provided.

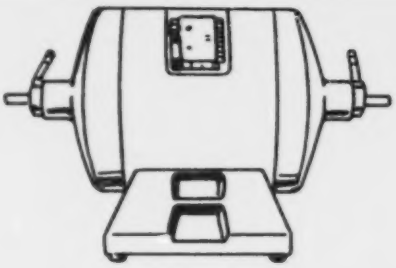
1. _____

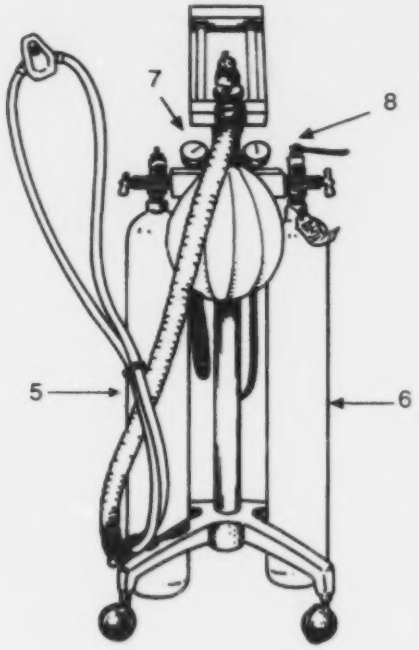
2. _____



3. _____

4. _____





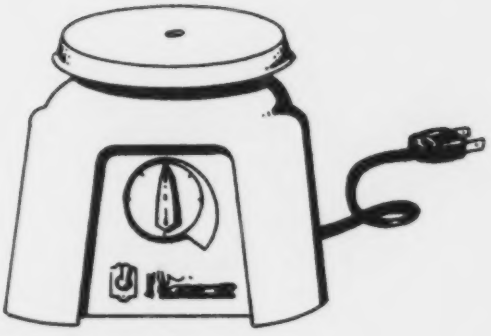
5. _____

6. _____

7. _____

8. _____

9. _____



Clinical/Laboratory Activities

1. At your clinical site, observe a dental assistant or dentist using the equipment discussed in this lesson. What safety measures were taken while the equipment was being used?

_____

_____

_____

_____

Lesson 3: Alginate Impressions

Objectives:

A. Identify the reasons why impressions of the dental arches are taken.

B. Identify the primary difference between dental plaster and stone.

C. Distinguish between impression trays designed for the upper and lower arches.

D. Identify uses of impression materials.

E. Identify equipment used to take alginate impressions.

F. Match key terms and their definitions.

G. Take an alginate impression.

H. Pour alginate impression.

Key Terms:

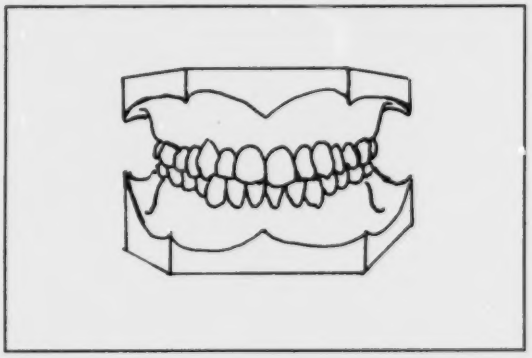
- Study Models
- Gypsum (jĭp´-sŭm)
- Alginate (ăl´-jĭ-nāt)
- Elastomeric (ē-lăs-tō-mer-ĭk) Impression

The dental aide should have a basic understanding of how and why impressions of the dental arches are taken. If the dentist and/or dental staff decide to train the aide in taking or pouring impressions, the information contained in this lesson will make the learning process easier for the aide.

Use of Dental Impressions

In dentistry, an appliance, denture, or sometimes even a restoration is custom-made to fit a patient's oral cavity even though the patient is not physically present. This is possible because an impression is obtained. An impression shows an imprint of the patient's teeth and gums. This impression can be used to produce a cast or model of the patient's teeth. An appliance, etc. can be made on the model that will fit the patient. Casts of a patient's upper and lower arches can also be used to make **study models**, which show the way the patient bites together (Figure 7.13). The dentist can study these casts when planning treatment for the patient.

Fig. 7.13 - Cast or Model of Impression



Plaster vs. Stone

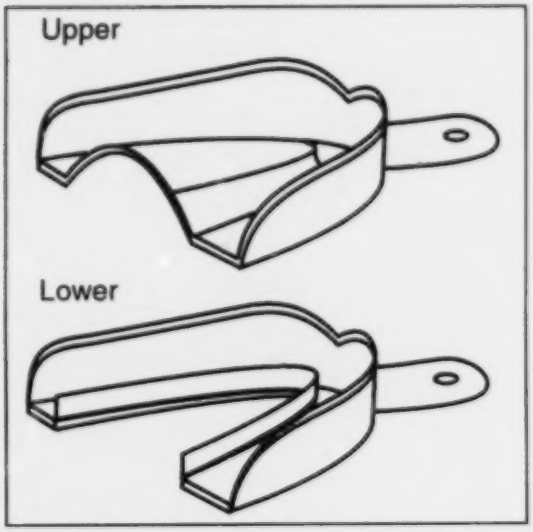
After an impression is disinfected, plaster or stone can be poured into it to form the model. Powders to make the plaster or stone are mixed with water to the consistency of melting ice cream, then gently vibrated into an impression. Plaster and stone are derived from a mineral in the earth's crust called **gypsum**. Plaster comes from the same mineral as stone, but stone is superior in quality giving its casts a harder surface

with more accurate detail. Some dentists simply refer to all plasters and stones as "gypsum," but they cannot be used interchangeably. Models made from plaster are only used when strength and accuracy of the model are not important.

Impression Trays

Impression trays are used to hold the impression material against the arch while the material sets. Upper impression trays cover the teeth and roof of the mouth. Lower trays are shaped like a horse shoe and do not cover the tongue (Figure 7.14). Impression trays are normally made of plastic or metal. Some are solid, and some have many holes in them to help keep the material in the tray when the tray is removed from the oral cavity.

Fig. 7.14 - Impression Trays



Impression Materials

There are three kinds of impression materials: alginate, rigid, and rubber-based. The dentist determines the type of impression to be taken.

Alginate - Impressions taken with alginate are usually poured in plaster. **Alginate** is a powder derived from seaweed. When mixed with water, it forms a putty that can be placed in an impression tray and seated over the patient's upper or lower arch. After three to five minutes, alginate gels, meaning it takes on a rubbery consistency.

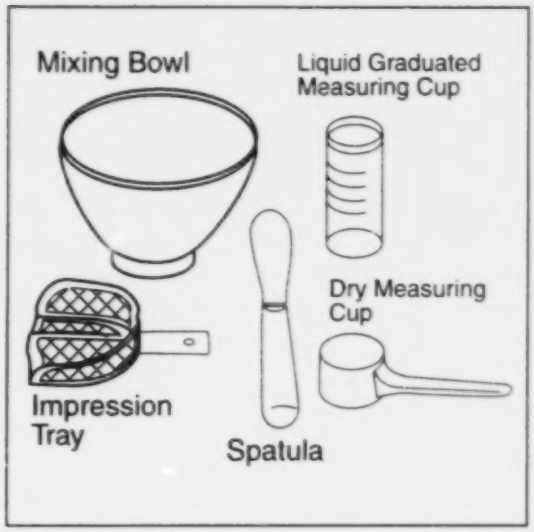
Rigid - impression materials are sometimes used to take impressions on patients who have no teeth. These impression materials harden instead of turning into a rubbery gel. If they were used on patients who had teeth, the material would flow between the teeth and harden. It would be impossible to remove the impression without destroying it and possibly damaging teeth. Rigid impression materials are supplied in the form of two pastes that resemble other types of impression materials, so the aide should double-check with a staff member before setting out impression material for the staff to use.

Rubber-Base - Rubber-based impression materials are also usually supplied in the form of two pastes that form a stiff and elastic rubber. These impression materials are more accurate than alginate, and are usually used to take impressions that will be poured in stone. Some doctors call these **elastomeric impression** materials.

Equipment Needed for Alginate Impression

In order to take an alginate impression, certain pieces of equipment are needed (Figure 7.15). A mixing bowl made of flexible rubber is used to mix the alginate impression. This same bowl can be used to mix the gypsum but must be cleaned first. A dry measuring cup is used to dispense the powder into the mixing bowl. A liquid

Fig. 7.15 - Instruments for Alginate Impressions



graduated measuring cup is used to measure the water. The water and powder are mixed together to a smooth consistency with a wide-bladed spatula. The mixed alginate is loaded into an impression tray, which is seated over the dental arch.

Steps of Procedure for Taking an Alginate Impression

1. Explain to patient what will be done.
2. Inspect patient's oral cavity.
3. Remove appliances or dentures if necessary.
4. Fit the impression tray by retracting the patient's cheek with one hand, inserting the tray by one corner, and centering it over the arch. If making a mandibular impression, ask patient to lift tongue.
5. Inspect the fit of the tray, and ask the patient if the tray is comfortable.
6. If the tray does not fit, obtain another size and repeat steps 4 and 5 until the proper size is obtained.
7. Adapt the tray with wax if necessary.
8. Measure correct amounts of alginate (3 scoops for maxillary and 2 scoops for mandibular) and cool water into mixing bowl. NOTE: Lines on measuring cup correspond to the number of scoops of alginate.
9. Obtain proper consistency by spreading mix against the sides of the bowl as quickly as possible.
10. Load the tray with the bulk of the material toward the front, and smooth the surface.
11. Seat the tray by retracting the patient's cheek with one finger while inserting one corner of tray, then center the tray over the arch.

Fig. 7.16 - Seating the Impression Tray

12. Seat tray <u>completely</u> over teeth and surrounding tissue (ask patient to lift his/her tongue until tray is seated). See Figure 7.17. Hold the tray in

Fig. 7.17 - Fully Seated Impression Tray

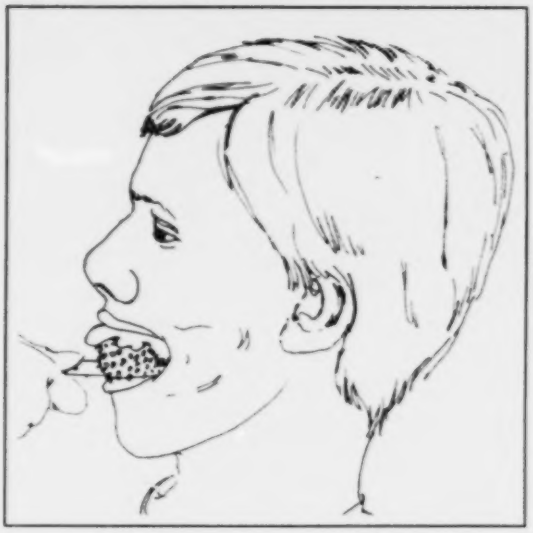


Fig. 7.18 - Bagging Impression

place until the alginate gels so the impression is not distorted by movement.

13. Gently pull patient's upper lip over the tray.

14. Control patient's gag reaction if necessary by telling the patient to breathe through the nose.

15. Assure patient that the tray must remain in place for a minute or two.

16. Check with finger to determine that the material has set.

17. Break suction by placing finger on the edge of the tray in the premolar area and firmly pressing downward (or pressing upward if making a mandibular impression), while protecting the opposing arch with the one finger.

18. Gently remove the tray. Retract one check with a finger while removing the tray. Allow patient to rinse if he/she wishes.

19. Inspect the impression for defects and determine whether it is suitable for pouring.

20. Rinse the impression to remove saliva or debris, dusting with plaster first if necessary in order to remove thick saliva that will not rinse off under running water.

21. Spray impression with disinfectant, and seal in plastic bag for proper disinfecting time. See Figure 7.18.

22. Blot impression dry with tissue or 2 x 2 (gauze pad), and prepare to pour it in plaster or stone. NOTE: The impression should be poured immediately after disinfection because it may swell or shrink, which would make an inaccurate imprint of the oral cavity.

Steps of Procedure for Pouring Alginate Impressions

1. After washing and drying the mixing bowl and spatula, dispense the proper

amounts of cool water and plaster or stone (3 to 5 scoops) into mixing bowl.

2. Mix the gypsum without whipping it until thoroughly wetted. The mix should be thick and creamy. A small amount of powder or water may be added to obtain the correct consistency.

3. Place mixing bowl on vibrator, and vibrate the mix only until trapped air is released (5 to 10 seconds). Trapped air can cause an air bubble to form, which would leave a hole in the cast where teeth should be located. See Figure 7.19.

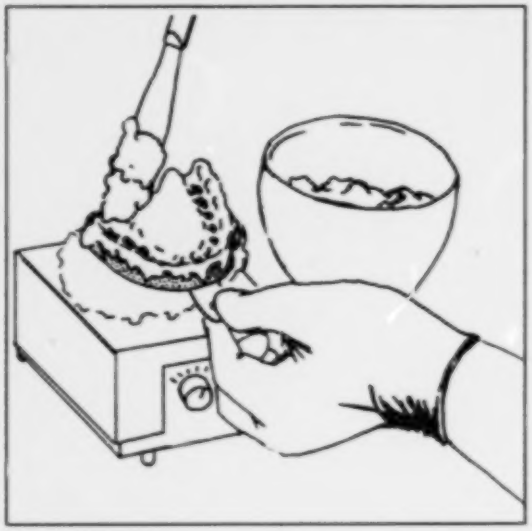
4. Beginning at one corner of the impression, vibrate small increments of gypsum into the impression. See Figure 7.20.

5. Allow each increment to flow through the anatomy in the impression before adding the next increment.

6. After teeth and surrounding tissues are filled, add larger increments to form a base.

Fig. 7.19 - Mixing Plaster

Fig. 7.20 - Vibrating Mix Into Impression

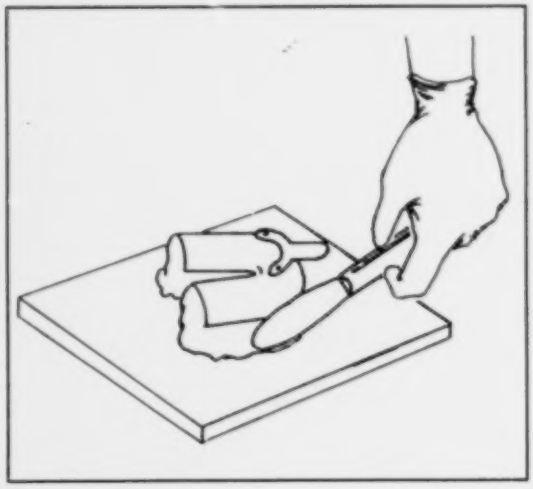


7. Remove the poured impression from the vibrator and add more gypsum as needed to complete the base.

8. Smooth the gypsum into a neat base without allowing the wet gypsum to extend over the edge of the tray. See Figure 7.21.

9. Place the poured impression aside so it may harden.

Fig. 7.21 - Smoothing the Base



Test Your Knowledge: Complete the following activity sheet to test your knowledge of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written unit evaluation. A score of 80 percent indicates you have mastered this material. Check with your clinical supervising staff member for skill testing.

Lesson 3: Alginate Impressions

Activity Sheet

Student Name _____ Date _____

1. From what mineral are plaster and stone derived? _____
2. From what natural source is alginate derived? _____
3. Circle the more accurate impression material.

   ALGINATE RUBBER BASE

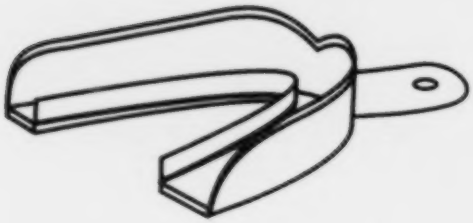
4. Circle the more accurate gypsum product.

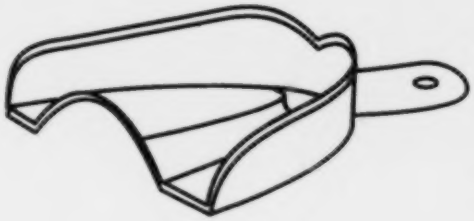
   STONE PLASTER

Identify the following equipment on the lines provided.

5. _____
6. _____
7. _____
8. _____
9. _____

Indicate which tray fits the upper arch and which tray fits the lower arch.





10. _____ 11. _____

Clinical/Laboratory Activities

1. At your clinical site, become familiar with the location of equipment and supplies used for taking impressions. Ask your clinical supervisor to demonstrate how an alginate impression is taken and how one is poured. Then, practice taking and pouring alginate impressions.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet #1: Laboratory Safety and Cleanup Rating _____

Comments: _____

_____

_____

Activity Sheet #2: Basic Laboratory Equipment Rating _____

Comments: _____

_____

_____

Activity Sheet #3: Alginate Impressions Rating _____

Comments: _____

_____

_____

Skill Sheet #1: Take Alginate Impression Rating _____

Skill Sheet #2: Pour Alginate Impression Rating _____

Written Unit Evaluation Score _____

Additional comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. Conduct _____ be illegal and still be ethical.

   a. Cannot
   b. Can
   c. Will usually
   d. Will always

2. A _____ is a licensed employee of the dentist whose duties include scaling and cleaning of a patient's teeth.

   a. Dental assistant
   b. Dental aide
   c. Dental hygienist
   d. Dental laboratory technician

3. Oral hygiene requirements do include:

   a. Picking your teeth with a toothpick after a meal.
   b. Brushing after ever meal.
   c. Flossing at least once a week.
   d. Brushing when needed.

4. Which of the following is <u>not</u> a personal hygiene grooming standard?

   a. Bathe before going to work.
   b. Shampoo your hair at least every two or three days.
   c. Wear the same uniform at least a week without washing it.
   d. Wear makeup in moderation.

Match the definitions in column B to the terms in column A. Write the correct letter in the blank space provided.

Column A	Column B
___ 5. Malocclusion	a. Crown, partial denture, or full denture
___ 6. Calculus	b. Tissue or area surrounding the root or apex of a tooth
___ 7. Prosthesis	c. Technical name for tartar/calcium deposit
___ 8. Prophylaxis	d. Poor positioning of teeth so they interfere with chewing
___ 9. Periapical tissue	e. Scaling and cleaning of teeth

Match the dental specialty with the correct definition. Write the correct letter in the blank space provided.

Column A	Column B
___ 10. Endodontics	a. Deals with the treatment and prevention of diseases of the soft tissue and bone surrounding the teeth
___ 11. Prosthodontics	b. Children's dentistry
___ 12. Pediatric Dentistry	c. Deals with the causes and treatment of irregularities or malocclusion of the teeth
___ 13. Orthodontics	d. Deals with the replacement of missing teeth with artificial substitutes
___ 14. Periodontics	e. Deals with the treatment of diseases and injuries of the pulp

Match the type of conduct in column B to the action described in column A. Write the correct letter in the blank space provided.

	Column A	Column B
___ 15.	People are treated as an inhuman object	a. Ethical
___ 16.	Enhances self respect	b. Unethical
___ 17.	Use or addiction to drugs	c. Illegal
___ 18.	Brings harm to others	
___ 19.	Maintains confidentiality and exhibits respect	
___ 20.	Not renewing the required license or certificate	

Written Unit Evaluation

Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. If a patient phones and tells the dental aide a tooth on the lower right side hurts every time he/she eats something sweet, the dental aide should tell the patient that:

   a. It sounds like the tooth is decayed and refer the patient to the receptionist to schedule an appointment for a filling.
   b. The patient should take two aspirin and call back if that does not relieve the pain.
   c. The patient should avoid eating sweets and the problem will go away.
   d. The receptionist will schedule an appointment for the patient to see the doctor to find out what is wrong.

2. If a caller tells the dental aide he/she wants to speak with the doctor immediately, the dental aide should:

   a. Put the doctor on the phone immediately.
   b. Ask the patient to hold while the aide checks with the doctor.
   c. Tell the caller that the doctor will call him back.
   d. Ask the caller to call later.

3. The most professional method of placing a caller on "hold" is to say:

   a. "Can you hold for two or three minutes?", then wait for a response.
   b. "Hold, please," and do not wait for a response.
   c. "Hold for a few minutes," and do not wait for a response.
   d. "I am putting you on hold now," and put the caller on hold immediately.

4. If the dental aide is confirming an appointment for a ten-year-old patient and the child for whom the appointment is scheduled answers the phone, the dental aide should:

   a. Ask to speak with the child's parent or guardian.
   b. Confirm the appointment with the child.
   c. Leave a message for the parent or guardian with the child.
   d. Any of the above.

5. If a patient is rude on the phone with the dental aide, the aide should:

   a. Hang up on the patient.
   b. Remain pleasant and try to calm the patient.
   c. Express anger and disgust with the patient's behavior.
   d. A or C

6. When a patient or visitor who has an appointment is greeted in the reception area, the dental aide should:

   a. Offer him/her coffee or tea.
   b. Tell the patient or visitor approximately how long it will be before he/she is seen.
   c. Choose something for the patient or visitor to read while waiting.
   d. Tell the patient or visitor approximately how long his/her appointment should take.

7. If a patient or visitor without an appointment wants to see the doctor, the dental aide should:

   a. Check with the doctor or qualified staff member to see if the doctor can see the patient or visitor.
   b. Explain to the patient or visitor that he/she must have an appointment, then make an appointment for him/her.
   c. Take the patient or visitor to see the doctor immediately.
   d. Tell the patient or visitor that he/she will have to take a seat and wait until the doctor can fit him/her in.

8. A word that the dental aide should never use in front of a patient is:

   a. Handpiece.
   b. Discomfort.
   c. Drill.
   d. Extraction.

9. Any patient who is fearful of treatment should be:

   a. Required to reschedule his/her appointment until he/she feels more comfortable.
   b. Placed on tranquilizers before the procedure.
   c. Told to be brave and not act like a coward.
   d. Given a simple explanation of what he/she can expect to feel.

10. A good communication tactic to use with children is to:

    a. Tell them that their parents will do something special for them if they are "good."
    b. Let them know that you are in charge and will not put up with whining or tantrums.
    c. Tell them a story.
    d. Try not to tower over them and maintain eye contact.

11. Which of these names will be last in a filing system?

    a. Alice B. Jones
    b. Albert C. James
    c. Al Q. Jones
    d. Alberta James

12. Which of these names should you find first in the file system?

    a. Bradley Simons
    b. Paul R. Seamons
    c. Rachel Sampson
    d. Wanda Simpson

13. If two patients have the same last name, the dental aide should file their charts according to the patients:

    a. Middle names.
    b. Street addresses.
    c. Ages.
    d. First names.

14. If the first three letters of two patients' last names are the same, the dental aide should refer to the ____ in order to file their charts.

    a. First names of the patients
    b. Middle initials of the patients
    c. Fourth letter of the last names
    d. Last letter of the last names

15. If the dental aide needs to remove a patient's file from the stacks only for a moment, he/she can mark the place where the file belongs by:

    a. Having another staff member keep his/her finger in the spot where the file has been removed.
    b. Placing an out guide in the spot where the file has been removed.
    c. Memorizing the names on the files in front and back of the spot where the file was removed.
    d. Removing the inside of the file, but leaving the cover in place in the stacks.

16. Tom Smith's records would be filed in front of Tom Smith, Jr.'s records because:

    a. The Nothing Before Something rule applies.
    b. Tom Smith is Tom Smith, Jr.'s father.
    c. When names are identical, the oldest patient is filed in front.
    d. Names that end in "Jr." are always the last records filed in a group of identical last names.

17. John Doe, Jr.'s records would be filed in front of Jon Doe's records because:

    a. These patients are not members of the same family.
    b. The Something Before Nothing rule applies.
    c. Younger patients with the same last name are always filed in front of older patients.
    d. "H" comes before "N" in the alphabet.

Written Unit Evaluation

Student Name _____ Date _____

Match the terms in Column B with definitions in Column A.

COLUMN A	COLUMN B
___ 1. Disease forms a lesion called a primary chancre, with long-term effects of gummas and cardio-vascular lesions	a. Viral Hepatitis
___ 2. Disease is caused by bacteria in the lungs producing swelling and difficulty breathing	b. Acquired Immune Deficiency Syndrome (AIDS)
___ 3. Virus that causes infections of the mouth, glands, eyes, and genitals, sometimes called fever blisters	c. Tuberculosis (TB)
___ 4. Inflammation of the liver causing fever, nausea, joint pain, and jaundice, transmitted by direct contact of infected body fluids	d. Herpes Simplex
___ 5. Characterized by an irreversible suppression of the immune system allowing the persistence of opportunistic infections	e. Syphilis

Match the disinfecting solutions in column B to their characteristic in column A. There may be more than one characteristic for each surface disinfectant.

COLUMN A	COLUMN B
___ 6. Inactivated by hard water	a. Glutaraldehyde
___ 7. 30-day activated solution	b. Iodophors
___ 8. Cause plastic chairs to crack	c. Sodium Hypochlorite
___ 9. Capable of sterilization in 6-10 hours	
___10. Must be mixed daily	
___11. Can be used as a surgical antiseptic scrub	

Circle the letter that corresponds to the best answer.

12. Microorganisms may be transmitted by the direct contact route. This method includes:

    a. Injury from contaminated sharp or instruments.
    b. Spray of dental handpiece.
    c. Contact with or touching soft tissue or teeth in the patient's mouth.
    d. Contact by sprays, splashes, or aerosols.

13. Microorganisms may be transmitted by splashes, coughs, or sneezes from an infected patient. This route of contamination is referred to as:

    a. Droplet contact route.
    b. Direct contact route.
    c. Indirect contact route.
    d. Airborne route.

14. Sterilization is best defined as:

    a. Destruction of many microbes.
    b. Destruction of spores and viruses.
    c. Destruction of all forms of life.
    d. Reduction of the growth of microorganisms.

15. The virus Hepatitis B causes:

    a. A temporary feeling of euphoria.
    b. Suppression of the immune system allowing the persistence of opportunistic infections.
    c. Infections of the mouth, glands, eyes, or genitals. Sometimes called fever blisters.
    d. Inflammation of the liver causing fever, nausea, joint pain, and jaundice.

16. The Human Immunodeficiency Virus (HIV) causes:

    a. A temporary feeling of euphoria.
    b. Suppression of the immune system allowing the persistence of opportunistic infections.
    c. Infections of the mouth, glands, eyes or genitals. Sometimes called fever blisters.
    d. Inflammation of the liver causing fever, nausea, joint pain and jaundice.

17. Which of the following represent the correct procedure for processing contaminated instruments?

    a. Preclean, presoak, sterilize, wrap, and dry and lubricate
    b. Presoak, preclean, dry and lubricate, sterilize, and wrap
    c. Presoak, preclean, dry and lubricate, wrap, and sterilize
    d. Wrap, presoak, preclean, sterilize, and dry and lubricate

18. Which of the following instruments cannot be cleaned in the ultrasonic cleaner?

    a. Dental handpieces
    b. Hinged instruments
    c. Plastic instruments
    d. Dentures

19. Which of the following is a characteristic for the disinfectant glutaraldehyde?

    a. Must be stored in opaque containers
    b. Must be mixed daily
    c. Is capable of sterilization in 6-10 hours
    d. Can be used without gloves

20. Which of the following is a characteristic for the disinfectant sodium hypochlorite?

    a. 30-day activated solution
    b. Can be used as a surgical antiseptic scrub
    c. Inactivated by hard water
    d. Must be mixed daily

21. Autoclaving process is accomplished by:

    a. Conventional heat alone.
    b. Submersion in disinfectant.
    c. A chemical steam instead of water.
    d. Superheated steam under pressure.

22. Responsibility for **regulating** employee safety in the United States has been assigned to the:

    a. Employees.
    b. Employers.
    c. Occupational Safety and Health Administration.
    d. Centers for Disease Control and Prevention.

23. The written documentation of job titles and duties that place employees at risk for exposure to Blood or Other Potentially Infectious Materials (BOPIM) is called the:

    a. Exposure control plan.
    b. Exposure determination.
    c. Methods of compliance.
    d. Schedule of compliance.

24. The dental staff should take special precautions to protect themselves when treating which patients?

    a. Patients who have tested HIV positive
    b. Patients who have had Hepatitis B in the past
    c. Anyone with a history of intravenous drug use
    d. All patients regardless of diagnosis

25. Employees should not use hand cream before putting on latex gloves because hand cream:

    a. Makes gloves feel greasy.
    b. May contain bacteria that would contaminate the gloves.
    c. Can cause allergic reactions when contacting latex.
    d. May break down latex.

26. In addition to being leakproof and puncture resistant, what other criteria must be met by a sharps container?

    a. It must be small enough to be heat sterilized.
    b. Employees must be able to tell when it is full.
    c. It must be bright yellow in color.
    d. It should be emptied and re-used when it is full.

27. If a contaminated instrument pierces the employee's skin, the FIRST thing he/she should do is:

    a. Put a band-aid on the wound and go back to work.
    b. Obtain a booster shot of the Hepatitis B vaccine.
    c. Have blood drawn to see if HIV has been transmitted.
    d. Immediately report the incident to his/her employer.

28. The Hepatitis B Vaccine must be offered by the employer within what time frame?

    a. Within ten days after the employee begins his/her job
    b. Before the new employee receives training required by OSHA
    c. After the employee has been tested to see if he/she is a carrier of Hepatitis B
    d. Within six months after employee orientation

29. Employee training must be provided to employees:

    a. In the evening after work.
    b. On weekends.
    c. During normal working hours.
    d. On the employee's day off.

30. The purpose of a BIOHAZARD label is to:

    a. Warn employees that items need to be heat sterilized.
    b. Warn employees that items are contaminated with BOPIM.
    c. Identify items that will be thrown away because they are contaminated.
    d. Identify items that have been decontaminated and are ready to use.

31. Employee medical records must be retained by the employer for:

    a. Three years.
    b. Five years.
    c. The duration of employment plus three years.
    d. The duration of employment plus thirty years.

32 The difference between sterilization and disinfection is that:

    a. Disinfection will destroy all forms of microbial life.
    b. Sterilization cannot kill bacterial endospores.
    c. Disinfection can destroy some forms of microbial life, but not viruses or spores.
    d. Sterilization is too time consuming to be used on a daily basis.

33. Pathogens are:

    a. A dormant state of bacteria.
    b. Disease causing microorganisms.
    c. Not destroyed by sterilization.
    d. No threat unless they are injected into the body.

34. Employers are required to provide the Hepatitis B vaccination to:

    a. Any employee who requests the vaccine.
    b. All employees within the dental office, whether they are occupationally exposed or not.
    c. Only those employees who experience an exposure incident.
    d. Only occupationally exposed employees.

35. If the dental aide cannot clean and disinfect contaminated instruments immediately after patient treatment, he/she may:

    a. Put them in the sink to wait for later.
    b. Leave them on the treatment tray until they can be cleaned.
    c. Put them in the instrument presoak.
    d. Heat sterilize them without cleaning them first.

36. Employees may wear lab coats which are used as PPE:

    a. In areas where BOPIM will be generated in solid or liquid form.
    b. To bring patients from the reception area to the treatment rooms.
    c. In the employee lounge.
    d. All of the above.

37. Although sodium hypochlorite is an effective surface disinfectant, it may cause corrosion of:

    a. Stainless steel.
    b. Formica countertops.
    c. Plastic and rubber.
    d. All of the above.

38. Items contaminated with BOPIM which are **NOT** capable of piercing or puncturing the skin:

    a. Are not regulated by OSHA.
    b. May be disposed of in the same manner as any other trash.
    c. Must be sterilized prior to disposal.
    d. Must be disposed of in a biohazard bag.

39. Employee training required by OSHA Hazard Communication Standard must be completed:

    a. Within ten working days of initial employment.
    b. Before performing job duties that place the employee at risk for occupational contact with potentially hazardous chemicals.
    c. Before HBV Vaccination of the employee takes place.
    d. All of the above.

40. Employee training records for bloodborne pathogens must be kept for:

    a. Three years.
    b. Five years.
    c. The duration of employment plus three years.
    d. The duration of employment plus thirty years.

41. Which employees within a dental office are covered by the OSHA Hazard Communication Standard?

    a. Those who are listed as occupationally exposed in the exposure determination
    b. Only employees who deal with hazardous chemicals in the course of performing job duties
    c. Only employees who request training regarding hazardous chemicals
    d. All employees within the workplace

42. A chemical which is known to cause cancer is referred to as:

    a. Corrosive.
    b. Carcinogenic.
    c. Toxic.
    d. Reactive.

43. The Hazard Communication Standard:

    a. Applies to ALL chemicals that may be found in the workplace.
    b. Protects employees from bloodborne diseases.
    c. Does not apply to drugs used in the course of patient treatment.
    d. Does not require compliance from all workplaces.

44. For safety information about the chemicals contained in a specific product, employees should refer to the:

    a. Incident report.
    b. Other employees in the workplace.
    c. Exposure control plan.
    d. Material Safety Data Sheet.

45. A material that may catch fire without warning is:

    a. Prone to spontaneous combustion.
    b. Radioactive.
    c. Corrosive.
    d. Toxic.

46. Dosimeter devices are designed to:

    a. Protect employees from radiation.
    b. Absorb toxins before they can affect employees' health.
    c. Measure the amount of toxins to which employees are exposed.
    d. Eliminate hazards from the workplace.

47. The person or persons who must be formally appointed in the written Hazard Communication Program is (are):

    a. Any occupationally exposed employees.
    b. The Hazard Communication Coordinator.
    c. The regional director of OSHA.
    d. The name of the employer.

48. Training required by the Hazard Communication Standard must be provided:

    a. Upon initial employment.
    b. Once very year.
    c. Whenever new hazards are introduced into the workplace.
    d. All of the above.

49. The Hazard Communication Coordinator may identify hazardous chemicals within the workplace by:

    a. Telephoning the manufacturers.
    b. Asking the employer to indicate which products contain hazardous chemicals.
    c. Contacting OSHA.
    d. Referring to the MSDS.

50. If a product is taken from its original container and placed in a secondary container for future use, the HCC may:

    a. Photocopy the original product label and affix the copy to the secondary container.
    b. Verbally advise employees of the hazards posed by the contents of the secondary container.
    c. Never affix a handwritten label to the container.
    d. Post signs indicating what is in the container.

51. Employees should be informed of hazards associated with new products through:

    a. Employee training sessions.
    b. Product labels.
    c. MSDS.
    d. CDC.

Lesson 1: Infection Control

Skill Sheet #1

WASH HANDS

Student Name _____ Date _____

EQUIPMENT:

1. Water
2. Soap
3. Paper towels
4. Wastebasket
5. Hand lotion

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Remove watch and/or rings, roll up sleeves. (Wash watch and rings if they have come into contact with contaminated materials.) NOTE: Place watch and/or rings on clean paper towel.		
2. Turn on water with knee, foot, or hand controls, adjust temperature so it is comfortable for you. CAUTION: Do not turn controls during procedure.		
3. Wet hands thoroughly, including and 2-3 inches above wrists; hold hands with wrists lower than elbows and fingertips pointed downward.		
4. Apply generous amount of soap to hands. If using bar soap, rinse it well before lathering and before returning it to the dish.		
5. Scrub hands for at least 15 seconds: a. Wash palms and back of hands with at least ten circular motions.		
b. Wash fingers and between fingers with at least ten circular motions.		
c. Wash wrists with at least ten circular motions.		
6. Rinse wrists and hands well; keep wrists lower than elbows.		
7. Dry hands well with paper towel or fresh clean towel, using one for each hand.		
8. Turn off faucet with dry paper towel.		

9. Discard paper towel. Be careful not to touch the part that touched the faucet.		
10. Apply hand lotion if desired.		

The student has satisfactorily completed the procedure "WASH HANDS" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

Lesson 1: Infection Control

Skill Sheet #2

DON AND REMOVE MASK

Student Name _____ Date _____

EQUIPMENT:

1. Water
2. Soap
3. Masks
4. Paper towels

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
Donning mask: 1. Wash hands.		
2. Pick up mask.		
3. Adjust mask over your nose and mouth.		
4. Tie top string behind head.		
5. Tie lower string behind head.		
6. Complete patient care. NOTE: Replace mask if it becomes moist.		
Removing mask: 7. Wash hands. NOTE: If wearing gloves, remove them before washing hands.		
8. Untie bottom string.		
9. Untie top string.		
10. Remove by holding top strings.		
11. Discard by dropping mask in approved container in exam room.		
12. Wash hands.		

The student has satisfactorily completed the procedure "DON AND REMOVE MASK" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 1: Infection Control

Skill Sheet #3

DON AND REMOVE DAILY CARE NONSTERILE GLOVES

Student Name _____ Date _____

EQUIPMENT:

1. Water
2. Soap
3. Paper towels
4. Nonsterile gloves

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
Donning gloves: 1. Wash and dry hands.		
2. Remove gloves from box, one at a time.		
3. Place your hand through opening and pull the glove up to the wrist.		
4. Repeat with the second glove.		
5. Adjust gloves to cover your wrists or cuffs of gown.		
6. Complete patient care.		
Removing gloves: 7. Grasp one glove on the inside of wrist at 1/2 inch below band of dirty side of glove without touching your skin.		
8. Pull glove down turning it inside out to cover the thumb and finger line. CAUTION: Do not completely remove the glove.		
9. With covered thumb and finger, pinch second glove at inside wrist area.		
10. Pull glove down until it is inside out over fingers.		
11. Touch only inside surfaces of gloves and remove gloves from both hands.		
12. Discard gloves by dropping them in appropriate container.		
13. Wash hands.		

The student has satisfactorily completed the procedure "DON AND REMOVE DAILY CARE NONSTERILE GLOVES" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 1: Infection Control

Skill Sheet #4

DON AND REMOVE GOWN

Student Name _____ Date _____

EQUIPMENT:

1. Water
2. Soap
3. Paper towels
4. Gown
5. Mask (optional)
6. Gloves (optional)

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
Donning gown: 1. Remove wrist watch and place on clean side of a paper towel.		
2. Wash hands.		
3. Don mask if necessary for procedure.		
4. Unfold gown with opening at the back.		
5. Put on gown by slipping arms into sleeves.		
6. Slip fingers inside neck band.		
7. Tie neck tie in back or fasten strips.		
8. Grasp waist ties in front and bring to back.		
9. Reach behind and overlap edges of gown.		
10. Bring waist ties in front and tie.		
11. Don gloves.		
12. Complete patient care.		
Removing gown: 13. Untie waist tie.		
14. Remove gloves and dispose in appropriate container in the room.		
15. Turn faucet on with clean paper towel.		
16. Wash and dry hands.		
17. Turn off faucet with clean, dry paper towel.		

18. If wearing mask, remove mask holding it by ties only and discard in approved container.		
19. Untie ties at neck, and loosen gown at neck.		
20. Slip fingers of one hand inside the cuff of the other hand. NOTE: Do not touch the outside of the gown.		
21. Pull gown down over hand.		
22. With gown-covered hand, pull gown down over other hand.		
23. Fold gown away from your body with contaminated side inward.		
24. Roll gown into a ball.		
25. Discard gown in proper receptacle.		
26. Turn on faucet with clean paper towel.		
27. Wash hands.		
28. Turn off faucet with clean, dry paper towel.		
29. Remove watch from clean side of paper towel.		
30. Dispose of paper towel in appropriate container.		

The student has satisfactorily completed the procedure "DON AND REMOVE GOWN" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) _____ Date _____

Lesson 2: Instrument Preparation, Disinfection, and Sterilization

Skill Sheet #5

BAG INSTRUMENTS

Student Name _____ Date _____

EQUIPMENT:

1. Bag or pouch
2. Marking pen
3. Instruments

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Put on heavy nitrile or utility gloves.		
2. Properly prepare instruments by presoaking, precleaning, and drying and lubricating.		
3. Label the bag or pouch with: a. name of instruments or tray setup,		
b. date, and		
c. initials or name.		
4. Place instruments in bag or pouch, being careful not to allow the instruments to perforate the bag or pouch.		
5. Remove the tab and seal (some bags may be self-sealing).		
6. Place in proper sterilization area or sterilizer.		
7. Remove gloves.		

The student has satisfactorily completed the procedure "BAG INSTRUMENTS" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 2: Instrument Preparation, Disinfection, and Sterilization

Skill Sheet #6

WRAP INSTRUMENTS

Student Name _____ Date _____

EQUIPMENT:

1. Approximately 11 - 14 inches of wrapping material
2. Instruments or trays with instruments
3. Special marking tape *
4. Label material (if needed)
5. Marking pen

* Some types of tape have a place on then to label the tray with the appropriate information and change colors to indicate the instruments have been sterilized.

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Put on heavy nitrile or utility gloves.		
2. Properly prepare instruments presoaking, precleaning, and drying and lubricating.		
3. Place instruments or tray in center of wrap.		
4. Fold up bottom corner and turn back two inches of end.		
5. Fold left corner over to edge of tray or instruments.		
6. Fold right corner over to other edge of tray or instruments.		
7. Fold top corner down to the middle and secure with tape.		
8. Label with: a. name of instruments or type of tray setup,		
b. date, and		
c. initials or name.		
9. Place in proper sterilization area or sterilizer.		
10. Remove gloves.		

The student has satisfactorily completed the procedure "WRAP INSTRUMENTS" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Instrument Preparation, Disinfection, and Sterilization

Skill Sheet #7

DECONTAMINATE OPERATORY

Student Name _____ Date _____

EQUIPMENT:

1. Operatory (or classroom with dental equipment)
2. Examination gloves
3. Utility gloves
4. Disinfectant

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. While still gloved, remove protective barriers from equipment used during the procedure.		
2. Discard all disposables.		
3. Place all contaminated instruments on a tray and take them to the sterilization area.		
4. Remove examination gloves and wash your hands.		
5. Use utility gloves and thoroughly scrub the surfaces using an approved disinfectant to remove any debris.		
6. Sponge or spray the surface again with the disinfectant. Leave the surface moist, and keep it moist for the manufacturer's recommended exposure time.		
7. After removing your utility gloves, place clean barriers in the operatory.		
8. Wash your hands.		

The student has satisfactorily completed the procedure "DECONTAMINATE OPERATORY" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Written Evaluation

Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. The plane that divides the oral cavity into upper and lower arches is the _____ plane.

   a. Occlusal
   b. Maxillary
   c. Mid-sagittal
   d. Mandibular

2. The same number and type of teeth can be found in:

   a. The maxillary arch as in the mandibular arch.
   b. Each different quadrant of the dentition.
   c. The right side of an arch as the left side of an arch.
   d. All of the above.

3. The dentition is divided into quadrants by the intersection of the:

   a. Maxillae and mandible.
   b. Mid-sagittal plane and the midline.
   c. Transverse plane and the occlusal plane.
   d. Occlusal plane and the midline.

4. The arches are divided into right and left halves by the:

   a. Occlusal plane.
   b. Midline.
   c. Transverse plane.
   d. Upper and lower arches.

5. A dental chart may at first be confusing to the dental aide because:

   a. All of the teeth look alike.
   b. It is difficult to tell the maxillary from the mandibular arch.
   c. The right side of the chart represents the patient's left side of the oral cavity.
   d. The teeth on the upper part of the chart represent the patient's mandibular arch.

6. The front part of the oral cavity is known as the _____area.

   a. Distal
   b. Anterior
   c. Incisal
   d. Posterior

7. A tooth that has no room to erupt in the dental arch is said to be:

   a. Occluded.
   b. Extracted.
   c. Congenitally missing.
   d. Impacted.

8. The teeth whose main function is to cut are the:

   a. Incisors.
   b. Cuspids.
   c. Premolars.
   d. Molars.

9. Which teeth are designed to help other teeth perform their functions?

   a. Incisors
   b. Cuspids
   c. Premolars
   d. Molars

10. The teeth whose main function is to tear are the:

    a. Incisors.
    b. Canines.
    c. Premolars.
    d. Molars.

11. Structures situated away from the midline following the curve of the dental jaw are called:

    a. Anterior.
    b. Incisal.
    c. Occlusal.
    d. Distal.

12. Which area is located furthest back in the oral cavity?

    a. Incisal region
    b. Occlusal region
    c. Posterior region
    d. Anterior region

13. Why is the term "deciduous" an appropriate name for primary teeth?

    a. They are the first teeth that erupt in humans.
    b. They are small and "squat" compared to permanent teeth.
    c. They have no roots to hold them in place.
    d. They will be shed to make room for permanent teeth.

14. If primary molars are lost prior to their shedding dates, the new teeth that replace them may be:

    a. Congenitally missing.
    b. Crowded.
    c. Exfoliated.
    d. Impacted.

15. What mechanism allows deciduous teeth to be shed?

    a. They are pushed out by the erupting permanent teeth.
    b. Their roots are resorbed (absorbed).
    c. They are pushed out by the dental arches as they grow.
    d. They must be extracted by the dentist.

16. Similarities between permanent and primary teeth include:

    a. There are the same number of permanent and primary teeth.
    b. Permanent teeth are as white as primary teeth.
    c. Permanent teeth have the same numbers of roots as their primary counterparts.
    d. All of the above.

17. Mixed dentition is <u>best</u> described as a mixture of:

    a. Anterior and posterior teeth.
    b. Primary and deciduous teeth.
    c. Primary and permanent teeth.
    d. Succedaneous and non-succedaneous teeth.

18. The surface of a mandibular tooth that faces the tongue may be called:

    a. Lingual.
    b. Facial.
    c. Palatal.
    d. Lingual or palatal.

19. The surface of a maxillary tooth that faces the tongue may be called:

    a. Lingual.
    b. Buccal.
    c. Palatal.
    d. Lingual or palatal.

20. The facial surface of an anterior tooth is the _____surface.

    a. Labial
    b. Palatal
    c. Buccal
    d. Lingual

21. The facial surface of a posterior tooth is the _____surface.

    a. Labial
    b. Palatal
    c. Buccal
    d. Lingual

22. The chewing surface of a posterior tooth is the:

    a. Buccal surface.
    b. Incisal edge.
    c. Labial surface.
    d. Occlusal surface.

23. The doctor and assistant are restoring **two** first molars in the maxillary right quadrant of a seven-year-old patient. Which combination of notation symbols may be used to identify these teeth on the patient's chart?

    a. 14 & J
    b. 3 & A
    c. 14 & I
    d. 3 & B

24. If the #1 tooth is missing, what symbol is assigned to the next tooth in that quadrant?

    a. The next tooth becomes #1, because there is no #1 in the arch.
    b. The next tooth is #2, and #1 is simply charted as "missing."
    c. The missing tooth is called A instead of #1, and the next tooth becomes #1.
    d. Both teeth are called #1 because #1 is missing, but the next tooth in line is also the #1 tooth in that quadrant.

25. The right side of a patient's chart is always located on the aide's:

    a. Left side.
    b. Right side.
    c. It depends on the type of chart.
    d. It depends on whether the chart is for deciduous or permanent teeth.

26. The mandibular left permanent first premolar is number:

    a. 20.
    b. 28.
    c. 21.
    d. 29.

27. The maxillary left deciduous cuspid is letter:

    a. C.
    b. H.
    c. D.
    d. G.

28. The hardest tissue in the human body is:

    a. Enamel.
    b. Cementum.
    c. Dentin.
    d. Pulp.

29. The tip of the root of a tooth is called the:

    a. Cusp.
    b. Crown.
    c. Apex.
    d. Dentin.

30. The softest tissue in teeth is the:

    a. Enamel.
    b. Dentin.
    c. Cementum.
    d. Pulp.

31. The tissue that covers the root of teeth is called the:

    a. Enamel.
    b. Dentin.
    c. Cementum.
    d. Pulp.

32. The bumps on the biting surface of posterior teeth are called the:

    a. Cusps.
    b. Apex.
    c. Crowns.
    d. Dentin.

33. The tooth tissue that plays a role in keeping the tooth anchored within the socket is the:

    a. Enamel.
    b. Cementum.
    c. Dentin.
    d. Pulp.

34. What is the only hard tissue located entirely inside the tooth?

    a. Enamel
    b. Dentin
    c. Cementum
    d. Pulp

35. In order to prevent dental caries, snack foods should be eaten:

    a. In small amounts throughout the day.
    b. Only after flossing the teeth.
    c. All at one time.
    d. Only in the morning.

36. After eating, acid is produced in the mouth for _____minutes.

    a. Thirty
    b. Ten
    c. Sixty
    d. Twenty

37. After eating, acids are produced by:

    a. Bacteria.
    b. Sugar.
    c. Starchy foods.
    d. The saliva.

38. Periodontal disease is caused by:

    a. Eating sugary foods.
    b. Buildup of calculus along and under the gumline.
    c. Bacteria in plaque.
    d. All of the above.

39. The most effective method of removing plaque from between the teeth and under the gums is to use:

    a. A soft toothbrush.
    b. Dental floss.
    c. A mouthwash that contains fluoride.
    d. A toothpick.

40. Teeth should be brushed at least how often?

    a. Once a day
    b. Three times a day
    c. After eating anything
    d. Morning and night

41. Teeth should be flossed <u>at least</u> how often?

    a. Once a day
    b. Three times a day
    c. After eating anything
    d. Morning and night.

42. Fluoride is effective in reducing:

    a. Periodontal disease.
    b. Dental caries.
    c. Bad breath.
    d. All of the above.

43. If the gums bleed while brushing or flossing, the:

    a. Toothbrush that is being used is too stiff.
    b. Floss is cutting the gums.
    c. Bristles of the brush are spreading out over the gums.
    d. Gums are inflamed by bacteria and calculus.

44. Periodontitis causes tooth loss by:

    a. Making the teeth decay.
    b. Destroying the bones.
    c. Producing acids.
    d. Destroying the tissues that compose the teeth.

45. In order to floss properly, the dental floss should:

    a. Never be placed under the gums.
    b. Only be used on back teeth.
    c. Always be placed under the gums.
    d. Only be used on front teeth.

46. Which of the following is necessary for proper brushing?

    a. A stiff brush
    b. A soft brush
    c. Spreading the bristles onto the gums
    d. A bent brush handle

Written Unit Evaluation

Student Name _____ Date _____

Match the following amalgam instruments in Column B with the correct descriptions in Column A.

COLUMN A	COLUMN B
___ 1. Used to bevel the margins of a cavity preparation; comes in a set with mesial or distal parts.	a. Burnisher
___ 2. Used to smooth, shape, or polish out roughness at the margin of a restoration.	b. Amalgam carver
___ 3. Used for trimming down excessive amalgam and creating tooth anatomy in amalgam.	c. Amalgam carrier
___ 4. Used to pack the amalgam restorative material into the preparation.	d. Margin trimmer
___ 5. Designed to pick up amalgam and transport it to the oral cavity.	e. Amalgam condenser

Match the following composite instruments in Column B with the correct descriptions in Column A.

COLUMN A	COLUMN B
___ 6. Used to retain the interproximal surfaces of the restoration and prevent bonding to the adjacent teeth.	a. Enamel chisel
___ 7. Used to position composite filling material in the prepared tooth.	b. Filling instrument
___ 8. Used to trim away excess enamel or dentin.	c. Matrix strips

Circle the letter that corresponds to the best answer.

9. The high-speed dental handpiece:

   a. Uses attachments.
   b. Polishes teeth with a rubber cup.
   c. Removes and cuts tooth surfaces.
   d. Is very expensive.

10. A prophylaxis angle:

   a. May have a fiber optic light mounted in the head.
   b. Uses only friction burs.
   c. Cuts tooth surface at a rapid speed.
   d. Polishes teeth with a rubber cup.

11. A burnisher is:

   a. Used to pack the amalgam restorative material into the preparation.
   b. Used to smooth, shape, or polish out roughness at the margin of a restoration.
   c. Used to remove carious dentin from a tooth.
   d. Used to pick up amalgam and transport it to oral cavity.

12. An amalgam carrier is:

   a. Used to pack the amalgam restorative material into the preparation.
   b. Used to smooth, shape, or polish out roughness at the margin of a restoration.
   c. Used to remove carious dentin from a tooth.
   d. Used to pick up amalgam and transport it to oral cavity.

13. An amalgam condenser is:

   a. Used to pack the amalgam restorative material into the preparation.
   b. Used to smooth, shape, or polish out roughness at the margin of a restoration.
   c. Used to remove carious dentin from a tooth.
   d. Used to pick up amalgam and transport it to oral cavity.

14. A matrix strip is:

   a. Used to undermine margins of enamel or dentin.
   b. Used to place composite filling material in the prepared-tooth.
   c. Designed to retain the interproximal surfaces of the restoration.
   d. Designed to trim down excessive restorative material.

15. The dental unit is the control center for:

    a. Instruments and 3-way syringe.
    b. 3-way syringe, x-ray machine, and instruments.
    c. Instruments, evacuation suction systems, and x-ray machine.
    d. Evacuation suction systems, handpieces, and 3-way syringes.

16. What is the most commonly used syringe in dentistry?

    a. Aspirating metal syringe.
    b. Nonaspirating metal syringe
    c. Aspirating disposable syringe
    d. Nonaspirating disposable syringe

17. Disposable needles used in dentistry:

    a. Are packaged 10 to the box.
    b. Have harpon-type plungers.
    c. Are available in various lengths and gauges.
    d. All of the above.

18. An amalgam restoration is defined as a filling:

    a. Made of resin and glass ionomer.
    b. Hardened or set by an invisible white light.
    c. Used in anterior teeth.
    d. Used in posterior teeth.

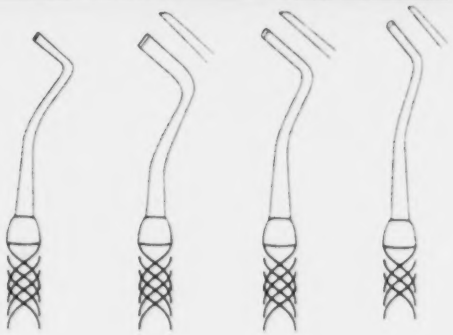
19. A composite restoration is:

    a. Used only on posterior teeth.
    b. 65 percent silver and referenced as a silver filling.
    c. A temporary filling.
    d. A white filling material of a type of plastic.

20. Oral surgery is the area of dentistry that deals with:

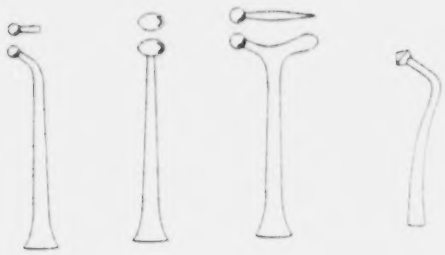
    a. Removal of teeth.
    b. Boney and soft tissue surgery.
    c. Treatment of fractured jaws.
    d. All the above.

21. What are the instruments shown below?



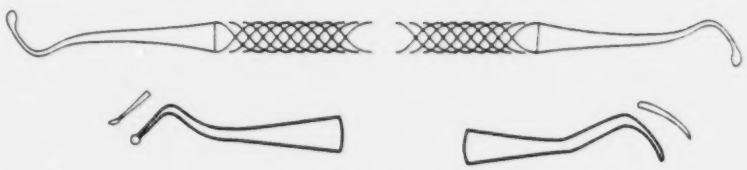
a. Spoon excavators
b. Margin trimmers
c. Hatchets
d. Amalgam condensers

22. What are the instruments shown below?



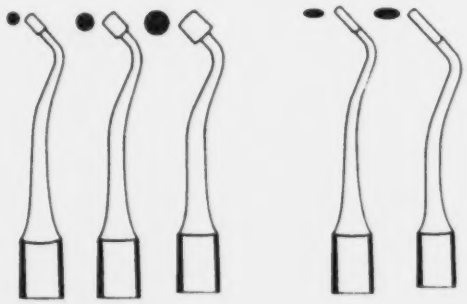
a. Burnishers
b. Margin trimmers
c. Enamel chisels
d. Hatchets

23. Which instrument is shown below?



a. Spoon excavator
b. Composite filling instrument
c. Periosteal elevator
d. Hatchet

24. Which instruments are shown below?



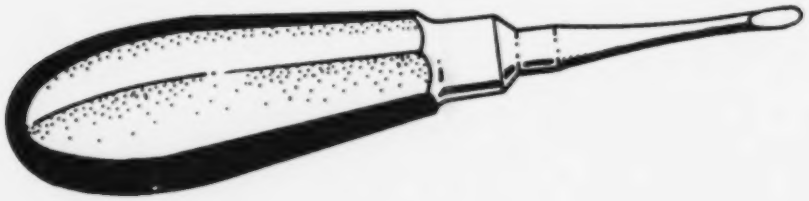
a. Hatchets
b. Margin trimmers
c. Amalgam condensers
d. Spoon excavators

25. The instrument shown is used for:

    a. Actual removal of the tooth from its socket.
    b. Leverage to luxate (loosen) the tooth from its socket.
    c. Detaching the gingival tissue from around the neck of the tooth.
    d. The removal of debris from the surgical site.

26. The instrument shown is used for:

    a. Actual removal of the tooth from its socket.
    b. Leverage to luxate (loosen) the tooth from its socket.
    c. Detaching the gingival tissue from around the neck of the tooth.
    d. The removal of debris from the surgical site.



27. The design of this bur is referred to as a:

    a. Tapered crosscut bur.
    b. Inverted cone bur.
    c. Tapered fissure plain cut bur.
    d. Texas cut bur.

28. The design of this bur is referred to as a(an):

a. Round bur.
b. Tapered fissure plain bur.
c. Inverted cone bur.
d. Straight plain.

29. What is this dental handpiece or attachment called?

a. Contra-angle
b. Prophylaxis angle
c. Conventional low-speed
d. High-speed

Lesson 2: Seating and Dismissal of Patients

Skill Sheet #1

SEAT PATIENT

Student Name _____ Date _____

EQUIPMENT:

1. Dental operatory or classroom mock-up
2. Substitute patient (volunteer)

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Greeted the patient in the reception area and escorted him/her to the operatory.		
2. Lowered the dental chair approximately to knee level, with the back upright and the arm raised.		
3. Asked the patient to be seated, and lowered the chair arm.		
4. Draped the patient with a disposable drape.		
5. Slowly adjusted the chair into the proper position, advising the patient of any chair movement.		
6. Attempted to initiate pleasant conversation to make the patient feel comfortable and relaxed.		
7. Prepared and had in place the patient's chart, radiographs, necessary instruments, and supplies.		

The student has satisfactorily completed the procedure "SEAT PATIENT" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Seating and Dismissal of Patients

Skill Sheet #2

DISMISS PATIENT

Student Name _____ Date _____

EQUIPMENT:

1. Dental Operatory or classroom mock-up
2. Substitute patient (volunteer)
3. Cleaning materials

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Allowed the patient to rinse and freshen his/her mouth after the dental procedure was completed.		
2. Wiped the patient's face clean of any debris or smudges, if necessary. Gave post-operative instructions, if applicable.		
3. Moved all equipment (light, operatory stools, and cart systems) out of the way. Slowly returned the dental chair to the upright and lowered position. Advised the patient of chair movement.		
4. Raised the arm of the chair and removed the patient's drape.		
5. Returned any personal belongings to the patient.		
6. Courteously assisted the patient from the chair.		
7. Dismissed and escorted the patient to the reception area.		
8. Cleaned and disinfected the operatory/treatment room according to the procedures in Unit III, Infection Control.		

The student has satisfactorily completed the procedure "DISMISS PATIENT" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Written Unit Examination

Student Name _____ Date _____

Match the terms in Column A with definitions in Column B.

COLUMN A		COLUMN B	
_____1.	Dosimeter	a.	Part of the x-ray machine that aligns the beam to the object and film; commonly referred to as the cone
_____2.	Supernumerary	b.	Monitoring badge which determines how much radiation exposure you are receiving
_____3.	PID	c.	Extra teeth
_____4.	X-rays	d.	Invisible, odorless, and can penetrate tissue without the person's knowledge

Match the type of tissue in Column A with its sensitivity level in Column B.

COLUMN A		COLUMN B	
_____5.	Skin	a.	High sensitivity
_____6.	Nerve	b.	Medium sensitivity
_____7.	Bone marrow	c.	Low sensitivity
_____8.	Mature bone		
_____9.	Lymphatic tissue		
_____10.	Muscle		
_____11.	Lens of eye		
_____12.	Salivary glands		
_____13.	Reproductive cells		

Circle the letter that corresponds to the best answer.

14. What are three characteristics of radiation?

    a. Noisy, hot, and bright
    b. Odorless, noisy, and hot
    c. Invisible, penetrating, and bright
    d. Invisible, odorless, and penetrating

15. Which of the following is a long-term effect of exposure to radiation?

    a. Hair loss
    b. Cataracts
    c. Nausea
    d. Vomiting

16. What is one short-term effect of high exposure to radiation?

    a. Birth defects
    b. Diarrhea
    c. Leukemia
    d. Shortened life expectancy

17. What is the "cardinal rule" that should be followed to avoid excessive exposure to radiation?

    a. Always turn off the light when exposing x-rays.
    b. Always turn off the light when developing x-rays.
    c. Never stay in the same room while x-rays are being exposed.
    d. Never stay in the same room while x-rays are being developed.

18. What do periapical films show?

    a. Entire tooth plus 2mm to 3 mm of surrounding bone
    b. Entire tooth and gum
    c. Both maxillary and mandibular teeth
    d. Only the root and surrounding bone

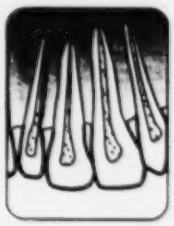
19. How are bitewing films used?

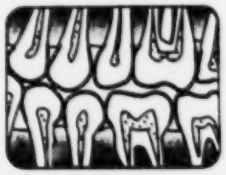
    a. To detect gum loss
    b. To detect interproximal carious lesions
    c. To determine location of sinus cavities
    d. To determine if a root has died

20. Which of the following is <u>not</u> a bitewing projection?

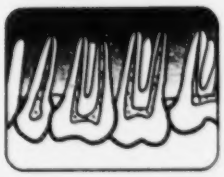
    a. Central lateral incisors
    b. Right first and second premolars
    c. Left first and second premolars
    d. Right first and second molars

21. Which of the following is <u>not</u> a periapical film from a complete radiographic survey?

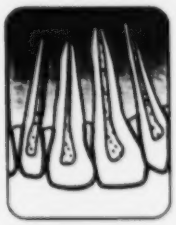
    a. 

    c. 

    b.

    d. 

22. The periapical film shown below is from what projection?



    a. Mandibular central lateral incisor projection
    b. Maxillary central lateral incisor projection
    c. Mandibular cuspid projection
    d. Maxillary cuspid projection

23. What is shown on an occlusal film?

    a. The entire maxillary and mandibular arches
    b. A single tooth including its roots
    c. Both upper and lower teeth
    d. Large segments of maxilla or mandible

24. An occlusal film is used to diagnose what type of problem?

    a. Impacted teeth
    b. Interproximal carious lesions
    c. Calculus
    d. Periodontal bone loss

25. What are the two extraoral films used in dentistry?

    a. Occlusal and interproximal
    b. Occlusal and bitewing
    c. Periapical and panoramic
    d. Panoramic and cephalometric

26. Since white light can ruin radiographs during processing, what precautions should the dental aide take to prevent white light from entering the darkroom?

    a. Cover the films with newspaper.
    b. Replace all light bulbs with safe lights.
    c. Lock the darkroom door.
    d. Lock the light switch cover.

27. Which of the following is <u>not</u> an advantage of using automatic processing?

    a. Shorter processing time is required.
    b. Equipment takes more space.
    c. Processing produces consistently good results.
    d. Finished film is ready to be mounted when it leaves processor.

28. When using the daylight processor, gloves should be removed:

    a. After the plastic barrier packets have been disposed of.
    b. Before entering the darkroom.
    c. When all films are processed.
    d. Before exposing the film.

29. When mounting radiographs, what is one clue in identifying anterior teeth?

    a. Anterior teeth are larger.
    b. Anterior teeth have three roots.
    c. Anterior teeth are in horizontal projections.
    d. Anterior teeth are in vertical projections.

30. What is one clue that helps identify maxillary molars?

    a. They are on the top.
    b. They have three roots.
    c. They have two roots.
    d. The roots curve to the right.

31. How can the bitewing radiographs be easily identified?

    a. They show maxillary and mandibular teeth on the same film.
    b. They are horizontal projections.
    c. They are larger than other projections.
    d. They show only one tooth at a time.

32. Where should radiographs be placed in the operatory?

    a. Near the setup tray
    b. Near the viewbox
    c. Directly on the overhead light
    d. Directly on the counter

33. Which of the following is <u>not</u> a good barrier to use on the PID cone, tubehead, and control panel?

    a. Plastic wrap
    b. Plastic bag
    c. Paper bag
    d. Aluminum foil

34. What are two surface disinfectants that can be used on radiographic equipment surfaces?

    a. Sodium hypochlorite and glutaraldhyde
    b. Iodophors and sodium chloride
    c. Glutaraldhyde and Comet cleanser
    d. Sodium chloride and Comet cleanser

35. Which items that come into contact with soft tissues must be sterilized prior to reuse?

    a. Instruments, gloves, aprons, and films
    b. Films, gloves, instruments, and sticks
    c. Film holders, films, instruments, and sticks
    d. Film holders, instruments, bite blocks, and sticks

Lesson 3: Processing Radiographs

Skill Sheet #1

PREPARE THE DARKROOM FOR DEVELOPING RADIOGRAPHS

Student Name _____ Date _____

EQUIPMENT:

1. Darkroom
2. Developing tank with running water
3. Replinisher
4. Stirring rod
5. Fixing solution
6. Developer solution
7. Radiographs
8. Hangers
9. Timer

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Check darkroom to ensure the working area is clean, dry, and free of spilled solutions.		
2. Turn on the tanks and adjust the water temperature.		
3. Check the solutions and add the proper solutions as required.		
4. Stir the solutions.		
5. Check the temperature of the solutions.		
6. Determine the correct developing time and set the timer.		
7. Mark the film hangers with the following information: a. patient's complete name		
b. date films were exposed		
c. number of films		
d. developer's initials		

NOTE: New gloves should be donned before handling contaminated film packets in the darkroom.

The student has satisfactorily completed the procedure "PREPARE THE DARKROOM FOR DEVELOPING RADIOGRAPHS" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 3: Processing Radiographs

Skill Sheet #2

MANUALLY PROCESS RADIOGRAPHS

Student Name _____ Date _____

EQUIPMENT:

1. Darkroom
2. Developing tank with running water
3. Replinisher
4. Stirring rod
5. Fixing solution
6. Developer solution
7. Radiographs
8. Hangers
9. Timer

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Prepare darkroom.		
2. Lock the darkroom.		
3. Turn on the safe light, and turn off the white light.		
4. Put on gloves.		
5. Open the film packets and allow the film to drop from the packets.		
6. Remove gloves and dispose of properly.		
7. Load the film hangers.		
8. Immerse the films in the developer.		
9. Activate the timer for the developing.		
10. Cover the tanks and wait for the timer to go off.		
11. Remove the film rack from the developer and rinse.		
12. Immerse films into the fixer. Set and activate timer.		
13. Place the rack in the water tank and wash.		
14. Remove the films from the water tank and hang them to dry.		

The student has satisfactorily completed the procedure "MANUALLY PROCESS RADIOGRAPHS" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 3: Processing Radiographs

Skill Sheet #3

PROCESS FILMS IN AN AUTOMATIC PROCESSOR

Student Name _____ Date _____

EQUIPMENT:

1. Radiographs
2. Automatic processor
3. Gloves

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Complete the identification information on the mount: a. patient's complete name		
b. date films were exposed		
c. doctor's name		
2. Remove plastic barrier packet and dispose of it properly.		
3. Remove gloves.		
4. Place unopened exposed film into the side openings. Open the film inside the automatic processor and place it in the receiving slot. Continue until all films have been inserted into the automatic processor.		
5. Dispose of waste (black protective papers and lead foil) in appropriate containers.		
6. Activate the processor.		
7. At the end of the processing cycle (usually 3 to 7 minutes), the processed films will be delivered at the opposite end of the machine. They are dry and ready to be mounted.		

The student has satisfactorily completed the procedure "PROCESS FILMS IN AN AUTOMATIC PROCESSOR" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. When a patient is to be given nitrous oxide, the dental aide may:

   a. Place the patient on the nitrous oxide by him/herself.
   b. Control how much nitrous oxide the patient is breathing.
   c. Turn the tanks on and off.
   d. All of the above.

2. Which piece of equipment can be used to eliminate air from a mix of plaster?

   a. Model trimmer
   b. Plaster vibrator
   c. Air compressor
   d. Suction machine

3. Which piece of equipment can be used to trim acrylic on a denture?

   a. Motorized lathe
   b. Model trimmer
   c. Plaster vibrator
   d. Air compressor

4. Which part of a bench motor can be used to polish acrylic?

   a. Pressure valve
   b. Acrylic bur
   c. Water valve
   d. Rag wheel

5. Which piece of equipment should never be used without turning on the water valve?

   a. Motorized lathe
   b. Plaster vibrator
   c. Model trimmer
   d. Air compressor

6. Which piece of equipment is turned on in the morning and left on all day?

   a. Air compressor
   b. Model trimmer
   c. Motorized lathe
   d. Plaster vibrator

7. Which of the following may cause the oxygen tank to become an "unguided missile" and smash through walls or the ceiling?

   a. Tank comes in contact with petroleum-based products.
   b. The regulator valve is knocked off the tank.
   c. Tank comes in contact with sparks or flames.
   d. The pressure within the tank is too high.

8. How is decontamination of appliances and dentures accomplished?

   a. Placing them in a plastic bag with disinfectant, then running the bag through an ultrasonic cleaning cycle
   b. Scrubbing them with soap and water, then heat sterilizing them
   c. Soaking them in liquid sterilant for several hours
   d. Spraying them with any household cleanser that is available

9. When supplies are removed from the storeroom, the dental aide may be required to:

   a. Order replacement item(s) immediately.
   b. Tell the dentist that supplies have been removed.
   c. Check the items off of an inventory list.
   d. Write down what the supplies will be used for.

10. While working in the dental lab, the aide should avoid wearing:

    a. Safety glasses or latex gloves because the plastic in them may contaminate chemicals used in the lab.
    b. Perfume or cologne, because it is usually flammable.
    c. Any jewelry, because it could be damaged by chemicals.
    d. Loose, flowing clothes that could catch fire and get caught in moving equipment.

11. Which impression material should not be used to take impressions on patients who have teeth in their dental arches?

    a. Rubber-based impression material
    b. Alginate impression material
    c. Stone impression material
    d. Rigid impression material

12. If the dentist wants a model to be as hard and strong as possible, the dental aide would pour the impression in:

    a. Stone.
    b. Rubber base.
    c. Plaster.
    d. Alginate.

13. Before the completed impression can be filled with a gypsum product, the impression must be:

    a. Removed from the impression tray.
    b. Trimmed on the model trimmer.
    c. Placed back into the patient's mouth to see if it fits.
    d. Disinfected.

14. What is the most accurate impression material?

    a. Stone impression material
    b. Rubber-based impression material
    c. Alginate impression material
    d. Rigid impression material

15. Why is the plaster vibrator used?

    a. To place the impression material into the tray
    b. To prevent the impression from hardening
    c. To prevent air bubbles from forming in the gypsum mix
    d. To disinfect the impression before pouring

16. What is illustrated below?

    a. Mandibular impression tray
    b. Maxillary impression tray
    c. Alginate form
    d. Plaster-of-paris form

Lesson 3: Alginate Impressions

Skill Sheet #1

TAKE ALGINATE IMPRESSION

Student Name _____ Date _____

EQUIPMENT:

1. Volunteer student (patient)
2. Impression trays
3. Impression mix
4. Bowl
5. Disinfectant
6. Plastic bag
7. Latex gloves

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Explain to patient what will be done.		
2. Inspect patient's oral cavity.		
3. Remove appliances or dentures if necessary.		
4. Fit the impression tray by retracting the patient's cheek with one hand, inserting the tray by one corner, and centering it over the arch. If making a mandibular impression, ask patient to lift tongue.		
5. Inspect the fit of the tray, and ask the patient if tray is comfortable.		
6. If the tray does not fit, obtain another size and repeat steps 4 and 5 until the proper size is obtained.		
7. Adapt the tray with wax if necessary.		
8. Measure correct amounts of alginate (3 scoops for maxillary and 2 scoops for mandibular) and cool water into mixing bowl.		
9. Obtain proper consistency by spreading mix against the sides of the bowl as quickly as possible.		
10. Load the tray with the bulk of the material toward the front, and smooth the surface.		
11. Seat the tray by retracting cheek with one finger while inserting one corner of tray, then centering tray over the arch.		

12. Seat tray completely over teeth and surrounding tissue (ask patient to lift his/her tongue until tray is seated).		
13. Gently pull patient's upper lip over the tray.		
14. Control patient's gag reaction if necessary.		
15. Assure patient that the tray must remain in place for a minute or two.		
16. Check with finger to determine that the material has set.		
17. Break suction by placing finger on the edge of the tray in the premolar area and firmly pressing downward (or pressing upward if making a mandibular impression), while protecting the opposing arch with the one finger.		
18. Gently remove the tray. Retract one cheek with a finger while removing the tray. Allow patient to rinse if he/she wishes.		
19. Inspect the impression for defects and determine whether it is suitable for pouring.		
20. Rinse the impression to remove saliva or debris, dusting with plaster first if necessary.		
21. Spray impression with disinfectant, and seal in plastic bag for proper disinfecting time.		
22. Blot impression dry with tissue or 2 x 2 (gauze pad), and prepare to pour it in plaster or stone.		

The student has satisfactorily completed the procedure "TAKE ALGINATE IMPRESSION" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 3: Alginate Impressions

Skill Sheet #2

POUR ALGINATE IMPRESSION

Student Name _____ Date _____

EQUIPMENT:

1. Plaster or stone mix
2. Bowl
3. Water
4. Spatula
5. Vibrator

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. After washing and drying the mixing bowl and spatula, dispense the proper amounts of cool water and plaster or stone into bowl.		
2. Mix the gypsum without whipping it until thoroughly wetted (mix should be thick and creamy).		
3. Place mixing bowl on vibrator, and vibrate the mix only until trapped air is released.		
4. Beginning at one corner of the impression, vibrate small increments of gypsum into the impression.		
5. Allow each increment to flow through the anatomy in the impression before adding the next increment.		
6. After teeth and surrounding tissues are filled, add larger increments to form a base.		
7. Remove the poured impression from the vibrator and add more gypsum as needed to complete the base.		
8. Smooth the gypsum into a neat base without allowing the wet gypsum to extend over the edge of the tray.		
9. Place the poured impression aside so it may harden.		

The student has satisfactorily completed the procedure "POUR ALGINATE IMPRESSION" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Dental Aide Competency Record

Name and Address: _____

Directions: Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:
3 Mastered - can work independently with no supervision
2 Requires Supervision - can perform job completely with limited supervision
1 Not Mastered - requires instruction and close supervision
N No Exposure - no experience or knowledge in this area

(IBM) 6-95

NOTE: The code in parentheses is the competency identification number used in computerized management systems.

3	2	1	N

A. Introduction to Dentistry

1. Function as a team member. (A001)
2. Maintain personal hygiene. (A002)
3. Maintain oral hygiene. (A003)
4. Maintain patient confidentiality. (A004)

Other _____

_____

3	2	1	N

B. Basic Office Procedures

1. Perform general office procedures. (B001)
2. Follow office etiquette. (B002)
3. Demonstrate proper telephone techniques. (B003)
4. Record phone messages. (B004)
5. File patient charts alphabetically. (B005)
6. Communicate effectively with patient. (B006)
7. Manage the special patient. (B007)
8. Communicate effectively with team members. (B008)

Other _____

_____

3	2	1	N

C. Infection Control and Occupational Safety

1. Demonstrate infection control techniques. (C001)
2. Wash hands. (C002)
3. Don and remove gloves. (C003)
4. Don and remove mask. (C004)
5. Don and remove gown. (C005)
6. Process and sterilize instruments to specifications of the dental clinical site. (C006)
7. Bag instruments. (C007)
8. Wrap instruments. (C008)
9. Decontaminate the operatory. (C009)
10. Follow regulatory guidelines established by OSHA Bloodborne Pathogens Standard. (C010)
11. Follow regulatory guidelines established by OSHA Hazard Communication Standard. (C011)

Other _____

_____

3	2	1	N

D. Basic Anatomy of the Oral Cavity

1. Identify teeth in oral cavity and on dental charts. (D001)
2. Identify parts and tissues of a tooth. (D002)
3. Identify tooth surfaces. (D003)
4. Distinguish between primary and permanent teeth. (D004)
5. Demonstrate brushing and flossing techniques. (D005)

Other _____

_____

3	2	1	N

E. Operative Equipment

1. Identify dental instruments and equipment. (E001)
2. Seat the dental patient in preparation for treatment or examination. (E002)
3. Dismiss the dental patient after a treatment or examination. (E003)
4. Prepare a tray for basic setup. (E004)
5. Prepare a tray for amalgam restoration. (E005)
6. Prepare a tray for composite restoration. (E006)
7. Prepare a tray for local anesthesia. (E007)
8. Prepare the tray setup for a forceps extraction. (E008)
9. Prepare the tray setup for placement of sutures. (E009)

Other _____

_____

3	2	1	N

F. Dental Radiology

1. Follow the "Cardinal Rule" for protecting yourself from radiation exposure. (F001)
2. Prepare the darkroom for developing radiographs (F002)
3. Process radiographs manually. (F003)
4. Process radiographs in an automatic processor. (F004)
5. Mount a Complete Radiographic Survey (CRS). (F005)
6. Follow infection control techniques during dental radiography procedures. (F006)

Other _____

_____

3	2	1	N

G. Basic Laboratory Procedures

1. Identify cleanup procedures to be followed in the lab. (G001)
2. Identify basic lab equipment and their functions. (G002)
3. Follow safety precautions when working around lab equipment. (G003)
4. Take alginate impression. (G004)
5. Pour alginate impression. (G005)

Other _____

_____

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Certificate of Achievement

This is to certify that

_____

Achieved the Competencies
as Acknowledged for
Dental Aide
And is Therefore Recognized

This _____ Day of _____, 19 ____

_____ _____

Instructor Administrator

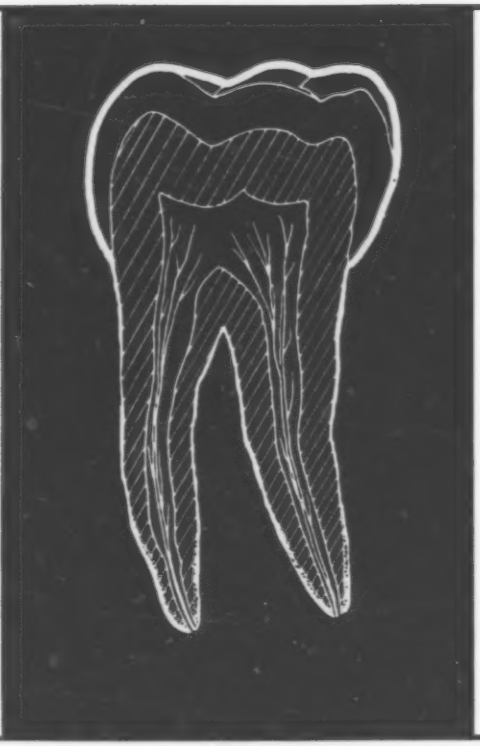
50-1143-K

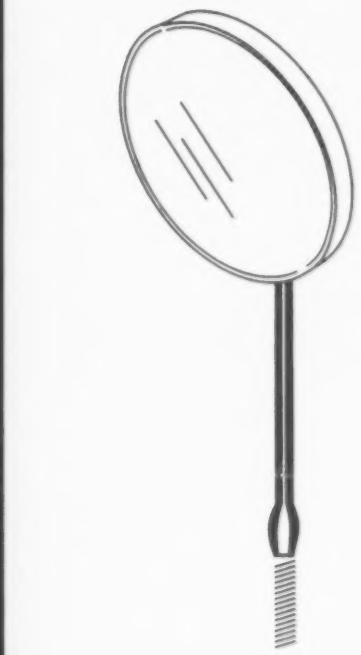
Dental Aide

Instructor Key

Instructional Materials Laboratory

Missouri Department of Elementary and Secondary Education





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Dental Aide

Instructor Key

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Instructional Strategies

This *Dental Aide* Instructor's Key is designed to be used with the *Dental Aide* Student Manual. It provides answers to the activity sheets and unit evaluations. The revised format and content were developed with input from secondary and post-secondary dental assistant and health occupations education instructors, dentists, and personnel from the Missouri Department of Elementary and Secondary Education and the Instructional Materials Laboratory at the University of Missouri-Columbia.

The self-instructional format provides health occupations education instructors the opportunity to address the needs of students whose health career interest is outside the nursing field. Following completion of the Health Care Assistant Core Competencies, a student interested in pursuing a career in the dental field can achieve dental specific competencies through this curriculum. Successful completion prepare the student for an entry-level position as a dental aide as well as a solid knowledge and skill base to continue education in a dental career.

The *Dental Aide* curriculum is primarily designed to be used independently by students who are in secondary health occupations programs or by individuals receiving on-the-job training in the dental office. Instructors should set up parameters for the individualized instruction, oversee the knowledge component of instruction (including the Written Unit Evaluations), and identify a clinical site and a clinical supervisor. The clinical supervisor should be responsible for supervising the student while at the clinical site, providing skill training, and evaluating mastery of skills.

A textbook such as *Modern Dental Assisting* by Hazel O. Torres and Ann Ehrlich, could be used to supplement learning. See the Bibliography in the student manual for a complete listing of references used in the development of this curriculum.

Since mastery of the information and skills will be evaluated using the Written Unit Evaluations (pink) and the Skill Sheets (pink), it is recommended that these pages be removed before the manual is given to the student. These pages are located together at the end of the manual.

A Dental Aide Competency Record Sheet and a Dental Aide Certificate of Achievement have also been included at the end of this manual. These could be removed and filed with the evaluation instruments.

The student manual is divided into seven units: Introduction to Dentistry, Basic Office Procedures, Infection Control and Occupational Safety, Basic Anatomy of the Oral Cavity, Operative Equipment, Dental Radiology, and Basic Laboratory Procedures. Units are further divided into lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets as

appropriate for the content. Activity Sheets are designed to assist the learner in mastering the information in each lesson. They also contain clinical/laboratory activities. Instructors should review or discuss these activities with students. The Activity Sheets may or may not be graded depending on individual student needs and instructor's preference.

Each unit has a written evaluation, which should be administered after all lessons in the unit are studied. A score of 80 percent is needed for mastery of information in the unit. Skill Sheets provide a record for mastery of the steps of procedure for each skill. The student should practice the skills outlined in the lessons before requesting evaluation of the skills. When evaluating mastery of the skills, the clinical supervisor can determine that mastery is obtained when he/she feels confident in the student's ability to perform the skill without direct supervision.

A Unit Checklist, located at the end of each unit, provides a method for keeping track of Activity Sheets, Skill Sheets, and Written Unit Evaluations to be completed in the unit.

In addition to being utilized in the secondary health occupations program to prepare dental aides, the *Dental Aide* curriculum could be used in other ways as well:

*Health occupations education instructors may choose some units of instruction as an adjunct to teaching career opportunities in dentistry, oral anatomy, or oral health instruction.

*Dental offices and clinical training sites may use all or part of the curriculum in training students or new staff members.

Answers to Activity Sheets and Written Evaluations

NOTE: Answers are not provided for Clinical/Laboratory Activities. Review or discuss these activities with students.

Unit I: Introduction to Dentistry

Lesson 1: The Dental Profession - Activity Sheet

1. a. The dentist alone is responsible for the diagnosis and care plan for each patient.

   b. The dental assistant is the "chairside" helper who sits beside the patient and is the dentist's second pair of hands. The dental assistant will anticipate the dentist's needs and be ready to supply the materials and instruments needed for various procedures. Additional responsibilities include patient education; taking impressions of teeth; sterilizing instruments; exposing, processing, and mounting radiographs; and preparing patients for treatment.

   c. The dental hygienist is a licensed employee who may perform prophylaxis (scaling and cleaning of teeth), expose radiographs, and educate patients under the supervision of the dentist.

   d. The business office receptionist is the team member who plans the appointments, schedules the patients, and is responsible for the accounting and financial activities of the dental practice. The receptionist is also responsible for answering the telephone.

   e. A dental laboratory technician is the individual who constructs the prosthesis (crown, partial denture, or full denture) specified by a written prescription of a dentist.

   f. The dental aide can be the second set of hands for the dental assistant allowing the concept of "six-handed dentistry" (dentist, assistant, dental aide). The dental aide may be responsible for the following tasks: seating and dismissing patients, preparing the operatory for procedures, preparing and sterilizing equipment and instruments, and processing and mounting radiographs.

2. a. Federal agencies offer jobs in clinics and hospitals that are federally funded.

   b. Armed services are the branches of military service and provide dental clinics to ensure a healthy fighting force.

   c. Hospitals may maintain a dental clinic for their patients.

   d. University dental schools employ dental assistants to assist in training dental students in four-handed dentistry.

   e. Dental educators are employed by institutions to train dental assistants.

Lesson 2: Personal Grooming - Activity Sheet

1. Answer should include at least three of the following:
   a. Bathe or shower before coming to work.
   b. Shampoo your hair at least every two or three days.
   c. Simple hair style.
   d. Wear make-up in moderation.
   e. Wear a clean and neat uniform.

2. a. Brush teeth three times a day.
   b. Floss teeth at least once a day.

Lesson 3: Ethical Standards - Activity Sheet

1. Answer should include at least four of the following:
   a. Discussing patient treatment outside the office.
   b. Promising "miraculous results" in a newspaper ad campaign.
   c. Not using new updates to dental procedures or expanded technical skills.
   d. Degrading another dentist's work or dental treatment plan.
   e. Discussing another dentist's fees.

2. Answer should include at least three of the following:
   a. Performing an expanded function that has not been assigned to dental auxiliaries in your state.
   b. Postdating or predating insurance or patient records and files.
   c. Causing injury to a patient because of negligence.
   d. Use or addiction of drugs.
   e. Not renewing the required license or certification.

Unit I: Introduction to Dentistry - Written Evaluation

1. a
2. c
3. b
4. c
5. d
6. c
7. a
8. e
9. b
10. e
11. d
12. b
13. c
14. a
15. b
16. a
17. c
18. b
19. a
20. b

Unit II: Basic Office Procedures

Lesson 1: Telephone Techniques and Appointment Confirmations - Activity Sheet

1. The answer should include at least three of the following:
   a. Do not put caller on "hold" unless absolutely necessary.
   b. Inform the caller that you are putting him/her on "hold" and about how long it will be before you return.
   c. Do not place a caller on "hold" until he/she agrees to wait.
   d. If the caller is going to be on "hold" longer than you had estimated, take them off "hold" and explain the reason.
   e. Thank caller for waiting.

2. a. Limits the number of missed appointments.
   b. Patients appreciate a confirmation.
   c. Gives the patient an opportunity to reschedule the appointment if necessary.
   d. Gives the dental office a chance to fill the time slot if the patient cancels.

3. The answer should reflect using the word "confirm" instead of "remind" because patients might resent being "reminded," as if you thought they were forgetful.

4. The following information should be filled in:

a.

TO: *Dr. Doe*

DATE: *Today* TIME: *9:15 A.M.*

BY: *Dental Aide*

[X] Please return call [X] Telephoned

[ ] Will call again [ ] Returned your call

Name of caller: *Dr. Joe Jackson*

of:

Phone: *123-4567*

Message: *Called to cancel lunch meeting on Friday at 11:00. Please call back before noon tomorrow.*

b.

TO: *Liz*

DATE: *Today* TIME: *1:00 P.M.*

BY: *Dental Aide*

[X] Please return call [X] Telephoned

[ ] Will call again [ ] Returned your call

Name of caller: *Katy Lee*

of: *Ed's Dental Supplies*

Phone: *456-7890*

Message: *If you do not call her back before 5:00 p.m. today, Ms. Lee will be here Friday at 11:00 a.m. for a demonstration.*

Lesson 2: Alphabetical Filing - Activity Sheet

1. Syd Anderseon
2. Cathy Braun
3. Kathy Brown
4. Jon Cunningham
5. Karen Dent
6. Leela Dent
7. William Dent
8. William T. Dent
9. Mary Hill
10. Mike Hill
11. Joan Jones
12. Joanie Jones
13. Shelley Lyle
14. Shelly Lyle
15. Heather Rackers
16. Cindy Schaefer
17. Cindy Schaeffer
18. Lou Wilsen
19. Lois Wilson
20. Louis Wilson

Lesson 3: Effective Communication - Activity Sheet

1. Tell the patient approximately how long it will be before he/she is escorted to the treatment room.

2. Offer the visitor paper, pen and an envelope so he/she may leave a note for the dentist.

3. a. Explain what the patient can expect to feel.
   b. Tell them what will happen in simple terms.
   c. Tell them how long the procedure should take.

4. a. Show them how the chair, three-way syringe, and oral evacuator work.
   b. Try to remain at eye-level with the child: do not tower over them.
   c. Answer their questions without scaring them.

5. a. Talk to the person you are upset with, not to others.
   b. Remain calm and polite.

6. Drill = Handpiece, Shot = Injection, Pain or Hurt = Discomfort, Needle = Syringe.

Unit II: Basic Office Procedures - Written Evaluation

1. d
2. b
3. a
4. a
5. b
6. b
7. a
8. c
9. d
10. d
11. a
12. c
13. d
14. c
15. d
16. a
17. d

Unit III: Infection Control and Occupational Safety

Lesson 1: Infection Control - Activity Sheet

1. a. Contact transmission; examples up to instructor's discretion
   b. Airborne transmission; examples up to instructor's discretion

2. a. Chicken Pox
   b. TB

3. a. Hepatitis B Virus
   b. Human Immunodeficiency Virus (HIV)
   c. Mycobaterium Tuberculosis
   d. Herpes Simplex Virus
   e. Treponema Pallidum

4. a. Mask
   b. Protective Eyewear (goggles or glasses)
   c. Examination Gloves
   d. Handwashing
   e. Uniforms

5. Airborne transmission

6. The answer should include handwashing and the use of personal protective equipment: gloves, gown, mask, and goggles

Lesson 2: Instrument Preparation, Sterilization and Disinfection - Activity Sheet

1. An X should be at: Chemical vapor, Autoclaving, and Dry heat.

2. Operatory surfaces should include at least 10 of the following:
   - light handles
   - light switch
   - chair switches
   - headrest on chair
   - tubing on handpiece
   - bracket table or tray
   - tubing on 3-way syringe
   - view box
   - X-ray tube head
   - X-ray controls
   - tubing on oral evacuation
   - counter tops
   - faucet handles
   - handle of composite compound curing lamp
   - drawer handles
   - handpiece control switches
   - operator's cart and components
   - amalgamator buttons
   - all counter tops
   - anything that was touched

3. 6 storage
   3 drying and lubricating
   4 wrapping or bagging
   1 presoaking
   2 precleaning
   5 sterilizing

4. 7 remove your utility gloves and place clean barriers in the operatory.
   1 remove protective barriers used during the procedure.
   4 remove examination gloves and wash your hands.
   2 discard all disposables.
   5 use utility gloves and thoroughly scrub the surfaces using an approved disinfectant to remove any debris.
   3 place all contaminated instruments on a tray and take them to the sterilization area.
   6 sponge or spray the surfaces again with the disinfectant, keeping them moist for the manufacturer's recommended exposure time.

Lesson 3: Bloodborne Pathogens Standard - Activity Sheet

1. OSHA monitors the health and safety of employees in the U.S.

2. CDC does research in matters that affect the health of all people and makes suggestions for the prevention of disease.

3. a. Schedule of compliance
   b. Exposure determination
   c. Methods of compliance
   d. HBV vaccination
   e. Post-exposure evaluation and follow-up
   f. Training
   g. Labeling
   h. Recordkeeping
   i. Exposure control plan

4. a. Universal precautions
   b. Engineering and work practice controls
   c. Personal protective equipment
   d. Housekeeping procedures
   e. Regulated waste

5. a. Lab coats, gowns, or scrub suits
   b. Filtration masks
   c. Impact-resistant safety glasses
   d. Heavy nitrile or utility gloves
   e. Portable respiration masks
   f. Latex examination gloves

Lesson 4: Hazard Communication Standard - Activity Sheet

1. False - The Hazard Communication Standard applies to all employees, whether they are exposed to chemicals or not.
2. True
3. True
4. True
5. Product Label
6. Hazardous Chemicals List
7. Material Safety Data Sheet (MSDS)

Unit III: Infection Control and Occupational Safety - Written Evaluation

1. e
2. c
3. d
4. a
5. b
6. b
7. a
8. c
9. a
10. c
11. b
12. c
13. a
14. c
15. d
16. b
17. c
18. a
19. c
20. d
21. d
22. c
23. a
24. d
25. d
26. b
27. d
28. a
29. c
30. b
31. d
32. b
33. d
34. c
35. a
36. a
37. d
38. b
39. a
40. d
41. b
42. c
43. d
44. a
45. c
46. b
47. d
48. d
49. a
50. a

Unit IV: Basic Anatomy of the Oral Cavity

Lesson 1: Arches, Planes and Quadrants - Activity Sheet

1. Maxillary Arch
2. Mandibular Arch
3. Maxillary Right Quadrant
4. Maxillary Left Quadrant
5. Mandibular Right Quadrant
6. Mandibular Left Quadrant
7. Midline (plane)
8. Occlusal Plane
9. Right
10. Left

Lesson 2: Names, Types and Functions of Teeth - Activity Sheet

1. Maxillary - First premolar - Maxillary first are the only ones with two roots
2. Maxillary - Maxillary molars are the only ones with three roots
3. Mandibular - Mandibular molars are the only molars with two roots
4. Maxillary right lateral incisor
5. Mandibular right first molar
6. Mandibular left central incisor
7. Maxillary left canine or cuspid
8. Maxillary right third molar

Lesson 3: Primary Dentition - Activity Sheet

1. Maxillary right deciduous central incisor
2. Maxillary left deciduous canine or cuspid
3. Mandibular left deciduous first molar
4. Maxillary right deciduous second molar
5. Maxillary right deciduous second molar
6. Mandibular right permanent first premolar
7. Mandibular right permanent first molar

Lesson 4: Surfaces of Teeth - Activity Sheet

1. Maxillary right second premolar - occlusal surface
2. Mandibular left first molar - buccal surface
3. Maxillary right third molar - mesial surface
4. Maxillary left second molar - palatal surface
5. Maxillary left central incisor - labial surface
6. Incisal edge
7. Labial surface
8. Occlusal surface
9. Mesial surface

Lesson 5: Notation Systems - Activity Sheet

1. R
2. 13
3. I
4. 26
5. E
6. 5
7. K
8. 19
9. A
10. 30

Lesson 6: Anatomical Parts and Tissues of Teeth - Activity Sheet

1. Crown
2. Root
3. Apex
4. Apical Foramen
5. Pulp
6. Dentin
7. Enamel
8. Cementum

Lesson 7: Factors that Influence Dental Health - Activity Sheet

1. The bacteria that live in plaque eat any kind of carbohydrate that is consumed, whether it is candy or potatoes. After eating the carbohydrates, the bacteria excrete acid onto the teeth for twenty minutes. This acid decomposes and causes the teeth to decay. (or words to that effect)

2. Every time the patient takes a sip of juice, a Twenty Minute Acid Attack is triggered. If the patient drinks the juice all at once, he/she will experience only one twenty minute period of acid production instead of several periods of acid production. (or words to that effect)

3. Fluoride makes tooth tissue resistant to breakdown by bacterial acids.

4. Periodontal disease is caused by the buildup of plaque along and under the gumline. Toothbrushing cannot reach between the teeth and under the gums to remove plaque, but dental floss can. (or words to that effect)

5. Bleeding of the gums, especially while brushing and flossing.

6. Calculus is hardened plaque that is stuck to the sides of teeth under the gums. It irritates the gums further and worsens the infection. (or words to that effect)

7. The disease will spread and destroy the bone around the teeth. If the condition is not treated the teeth will loosen and fall out. (or words to that effect)

Unit IV: Basic Anatomy of the Oral Cavity - Written Evaluation

1. a
2. c
3. d
4. b
5. c
6. b
7. d
8. a
9. c
10. b
11. d
12. c
13. d
14. d
15. b
16. c
17. c
18. a
19. d
20. a
21. c
22. d
23. d
24. b
25. a
26. c
27. b
28. a
29. c
30. d
31. c
32. a
33. b
34. b
35. c
36. d
37. a
38. d
39. b
40. d
41. a
42. b
43. d
44. b
45. c
46. b

Unit V: Operative Equipment

Lesson 1: Dental Operatory - Activity Sheet

1. A
2. C
3. B
4. A
5. A
6. D
7. High-speed handpiece
8. Conventional low-speed handpiece
9. Tapered fissure plain bur
10. Inverted cone bur
11. Prophylaxis angle attachment
12. Contra-angle attachment
13. Straight crosscut bur
14. Round bur

15. a. Delivers a stream of water
    b. Delivers a stream of air
    c. Delivers a combined spray of air and water

16. F
17. T
18. T
19. T
20. F
21. T

Lesson 2: Seating and Dismissal of Patients - Activity Sheet

1. a. Greet the patient in the reception area and escort him/her to the operatory.
   b. Lower the dental chair approximately to knee level, with the back upright and the arm raised.
   c. Ask the patient to be seated, and lower the chair arm.
   d. Drape the patient with a disposable drape.
   e. Slowly adjust the chair into the proper position. Always advise the patient of chair movement.
   f. Attempt to initiate pleasant conversation to make the patient feel comfortable and relaxed.
   g. Prepare and have in place the patient's chart, radiographs, necessary instruments, and supplies.

2. a. Allow the patient to rinse to freshen his/her mouth, after the dental procedure is completed.
   b. Wipe the patient's face clean of any debris or smudges, if necessary. Give post-operative instructions, if applicable.
   c. Move all equipment (light, operatory stools, and cart systems) out of the way. Slowly return the dental chair to the upright and lowered position. Again, advise patient of any chair movement.
   d. Raise the arm of the chair and remove the patient's drape.
   e. Return any personal belongings to the patient.
   f. Courteously assist the patient from the chair.
   g. Dismiss the patient and escort him/her to the reception area.
   h. Clean and disinfect the operatory/treatment room according to the procedures in Unit III, Infection Control and Occupational Safety.

3. If dental team members behave in a professional, courteous manner, they will build patient confidence in their abilities to provide good dental treatment. Patients will also be more relaxed during dental procedures in this type of environment.

Lesson 3: Restorative Procedures - Activity Sheet

1. a. Mouth mirror
   b. Explorer
   c. Cotton pliers

2. a. Spoon excavator
   b. Gingival margin trimmer set
   c. Amalgam carriers
   d. Amalgam condenser
   e. Amalgam carvers
   f. Burnishers
   g. Matrix retainers and bands
   h. Miscellaneous items
   i. Basic setup

3. a. Basic setup
   b. Spoon excavator
   c. Enamel chisel
   d. Hatchet
   e. Filling instrument
   f. Matrix strips and strip clip
   g. Finishing materials
   h. Miscellaneous items

4. a. Aspirating syringe
   b. Disposable needle
   c. Anesthetic cartridge

5. Explorers
6. Filling instruments
7. Amalgam condensers
8. Gingival margin trimmers
9. Matrix retainer
10. Burnishers
11. Enamel chisel
12. Hatchets
13. Amalgam carrier
14. Anesthetic cartridge

Lesson 4: Surgical Procedures - Activity Sheet

1. a. Dental abscess
   b. Advanced periodontal disease
   c. Caries, where conservation is not possible or acceptable to a patient
   d. Part of orthodontic treatment
   e. Impacted teeth, commonly affecting third molars (wisdom teeth)
   f. Failure of endodontic (root canal) treatment

2. Elevator
3. Forceps
4. Needle holder
5. Needle and suture silk
6. Periosteal elevator

Unit V: Operative Equipment - Written Evaluation

1. d
2. a
3. b
4. e
5. c
6. c
7. b
8. a
9. c
10. d
11. b
12. d
13. a
14. c
15. d
16. a
17. c
18. d
19. d
20. d
21. c
22. a
23. c
24. c
25. c
26. b
27. c
28. c
29. a

Unit VI: Dental Radiology

Lesson 1: Ionizing Radiation - Activity Sheet

1. C
2. A
3. B

4. a. Invisible
   b. Odorless
   c. Can penetrate tissue without the person's knowledge

5.

S	Erythema of skin	L	Birth defects
L	Cataracts	L	Cancerous tumors
S	Loss of hair	L	Leukemia
S	Nausea	S	Diarrhea

6.

L	Muscle	H	Bone marrow	H	Reproductive cells
M	Lens of the eye	L	Nerve	H	Lymphatic tissue

7. a. Position yourself at least 6 feet from the x-ray tubehead.
   b. Stand behind a lead-lined wall or shield.
   c. Never hold a tubehead during exposure.

8. Never stay in the same room while x-rays are being exposed.

Lesson 2: Radiographic Films - Activity Sheet

1. B
2. E
3. A
4. E
5. C
6. D
7. D
8. A
9. C

Lesson 3: Processing Radiographs - Activity Sheet

1. a. Before processing begins, the darkroom should be checked to ensure the working area is clean, dry, and free of spilled solutions.
   b. Turn on the tanks and adjust the water temperature to 68°F.
   c. Check the solutions and add the proper replenisher/developer or fixer as required. Never add water to these solutions.
   d. Stir the solutions.
   e. Check the temperature of the solutions.
   f. Determine the correct developing time and set the timer. Do not activate the timer.
   g. Mark the film hangers with the following information:
      (a) patient's complete name
      (b) date films were exposed
      (c) number of films
      (d) developer's initials

2. ___ Can have a "wet" reading after 3 minutes in the fix.
   ___ Time varies according to temperature of solutions.
   _X_ Can be used without a darkroom.
   ___ 10-12 minutes processing time.
   _X_ Ready to put in patients chart in 4 to 6 minutes.
   _X_ Requires minimum space.
   _X_ Standardized development process.
   ___ Do not need to be replenished.

Lesson 4: Mounting Radiographs - Activity Sheet

1. a. Maxillary
   b. Mandibular
   c. Bitewings
2. vertical, horizontal
3. two, three

Lesson 5: Infection Control - Activity Sheet

1. a. Gloves
   b. Mask
   c. Protective eyewear

2. a. PID
   b. The x-ray activation button
   c. Control panel
   d. Tubehead

3. a. Household plastic wrap
   b. Large plastic bags
   c. Aluminum foil

4. Answer should include two of the following:
   a. all instruments
   b. film holders
   c. bite blocks or sticks

Unit VI: Dental Radiology - Written Evaluation

1. b
2. c
3. a
4. d
5. b
6. c
7. a
8. b
9. a
10. c
11. b
12. b
13. a
14. d
15. b
16. b
17. c
18. a
19. b
20. a
21. c
22. b
23. d
24. a
25. d
26. c
27. b
28. a
29. d
30. b
31. a
32. b
33. c
34. a
35. d

Unit VII: Basic Laboratory Procedures

Lesson 1: Laboratory Safety and Cleanup - Activity Sheet

1. a. Never operate lab equipment without training.
   b. Do not wear loose, flowing clothes around lab equipment.
   c. Long hair should be pulled back away from the face.
   d. Wear impact-resistant safety glasses when operating model trimmer and lathe.
   e. Equipment should be turned off when not in use.
   f. Do not clean or maintain equipment without training.
   g. Learn the meanings of the warning labels on lab equipment.

2. a. The flame or spark can make the oxygen explode.
   b. The oxygen can escape from the tank all at once, causing the tank to become an "unguided missile."
   c. The oxygen container may explode.

3. Rinse the appliances or dentures under running water, then spray them with an EPA registered, hospital strength disinfectant. Seal them in a plastic bag, then run the bag through an ultrasonic cleaning cycle.

4. The lab should be cleaned after every use so staff members who enter or use the lab later are not placing themselves or patients at risk for cross contamination.

5. The dental office may run out of vital supplies with an inaccurate inventory control checklist.

Lesson 2: Basic Lab Equipment - Activity Sheet

1. Acrylic burs
2. Model trimmer
3. Rag wheel
4. Motorized lathe (bench motor)
5. Oxygen tank
6. Nitrous oxide tank
7. Pressure gauge
8. Regulator valve
9. Plaster vibrator

Lesson 3: Taking and Pouring Alginate Impressions - Activity Sheet

1. Gypsum
2. Seaweed
3. Rubber-based
4. Stone
5. Liquid graduated measuring cup
6. Dry measuring cup (for alginate)
7. Mixing bowl

8. Spatula
9. Impression tray
10. Lower impression tray
11. Upper impression tray

Unit VII: Basic Laboratory Procedures - Written Evaluation

1. c
2. b
3. a
4. d
5. c
6. a
7. b
8. a
9. c
10. d
11. d
12. a
13. d
14. b
15. c
16. b

Name: _____

Directions: Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:
3 Mastered - can work independently with no supervision
2 Requires Supervision - can perform job completely with limited supervision
1 Not Mastered - requires instruction and close supervision
N No Exposure - no experience or knowledge in this area

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NOTE: The code in parentheses is the competency identification number used in computerized management systems.

3	2	1	N

A. Introduction to Dentistry

1. Function as a team member. (A001)
2. Maintain personal hygiene. (A002)
3. Maintain oral hygiene. (A003)
4. Maintain patient confidentiality. (A004)

Other _____

_____

3	2	1	N

B. Basic Office Procedures

1. Perform general office procedures. (B001)
2. Follow office etiquette. (B002)
3. Demonstrate proper telephone techniques. (B003)
4. Record phone messages. (B004)
5. File patient charts alphabetically. (B005)
6. Communicate effectively with patient. (B006)
7. Manage the special patient. (B007)
8. Communicate effectively with team members. (B008)

Other _____

_____

3	2	1	N

C. Infection Control and Occupational Safety

1. Demonstrate infection control techniques. (C001)
2. Wash hands. (C002)
3. Don and remove gloves. (C003)
4. Don and remove mask. (C004)
5. Don and remove gown. (C005)
6. Process and sterilize instruments to specifications of the dental clinical site. (C006)
7. Bag instruments. (C007)
8. Wrap instruments. (C008)
9. Decontaminate the operatory. (C009)
10. Follow regulatory guidelines established by OSHA Bloodborne Pathogens Standard. (C010)
11. Follow regulatory guidelines established by OSHA Hazard Communication Standard. (C011)

Other _____

_____

3	2	1	N

D. Basic Anatomy of the Oral Cavity

1. Identify teeth in oral cavity and on dental charts. (D001)
2. Identify parts and tissues of a tooth. (D002)
3. Identify tooth surfaces. (D003)
4. Distinguish between primary and permanent teeth. (D004)
5. Demonstrate brushing and flossing techniques. (D005)

Other _____

_____

3	2	1	N

E. Operative Equipment

1. Identify dental instruments and equipment. (E001)
2. Seat the dental patient in preparation for treatment or examination. (E002)
3. Dismiss the dental patient after a treatment or examination. (E003)
4. Prepare a tray for basic setup. (E004)
5. Prepare a tray for amalgam restoration. (E005)
6. Prepare a tray for composite restoration. (E006)
7. Prepare a tray for local anesthesia. (E007)
8. Prepare the tray setup for a forceps extraction. (E008)
9. Prepare the tray setup for placement of sutures. (E009)

Other _____

_____

3	2	1	N

F. Dental Radiology

1. Follow the "Cardinal Rule" for protecting yourself from radiation exposure. (F001)
2. Prepare the darkroom for developing radiographs (F002)
3. Process radiographs manually. (F003)
4. Process radiographs in an automatic processor. (F004)
5. Mount a Complete Radiographic Survey (CRS). (F005)
6. Follow infection control techniques during dental radiography procedures. (F006)

Other _____

_____

3	2	1	N

G. Basic Laboratory Procedures

1. Identify cleanup procedures to be followed in the lab. (G001)
2. Identify basic lab equipment and their functions. (G002)
3. Follow safety precautions when working around lab equipment. (G003)
4. Take alginate impression. (G004)
5. Pour alginate impression. (G005)

Other _____

_____

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